The Newspaper of Information Systems Management
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# COMPUTERWORLD

## Forecast '96

Don't even bother with *Computerworld*'s annual Forecast issue if you can't handle a sizzling, byte-size look at 10 of the juiciest technical areas and nine of the sexiest up-and-coming companies.

And if you aren't interested in thought-provoking words from 11 of the top IS leaders, don't take a look either. If that's the case, you won't want to read the fun stuff, such as scintillating facts you just have to know, flippant capsules of the industry's past and predictions of its future, where to find the most bizarre 'net stops and a sneak peek at what our newspaper might look like in the year 2000. So if you can't take the heat, walk away now, because we predict 1996 is off to a blazing start. Forecast begins on page 17.

☞ *IS departments will be hiring like crazy in 1996. Our first annual* **Jobs Outlook Survey** *reveals the hottest jobs and where to find them, plus the skills most in demand. Page 77.*

Newspaper

# A done deal?

### Novell anxious to sell WordPerfect; Boston firm top suitor

By Lisa Picarille

A Boston-based venture capital firm tops the list of potential buyers for Novell, Inc.'s WordPerfect unit, *Computerworld* has learned.

Bain Capital, Inc. is spearheading a group of investors that includes some unnamed former WordPerfect and Novell executives, according to several sources inside Novell and others close to the deal. The venture firm is headed by financier W. Mitt Romney, who lost a 1994 Republican bid to unseat incumbent Sen. Edward M. Kennedy (D-Mass.).

Bain has invested in other software ventures, including Corporate Software, Inc., Jostens Learning Corp. and R. R. Donnelley's Global Software Services.

"We are close to announcing something. Maybe in the second week of January," said Liz Tanner, a spokeswoman for Novell's Business Applications Division, commenting on the rumors of a first-quarter sell-off of that unit. However, she declined to comment on any negotiations. Bain also declined to comment.

In late October, Novell announced its intention to sell off WordPerfect by Jan. 31.

"Novell badly wants to close the quarter with WordPerfect off the books," said Jeffrey Tarter, editor of "Softletter," an industry newsletter in

**WordPerfect,** *page 105*

# IBM's delay riles users

### Yet big iron disk prices to fall as next arrays slip into 1997

By Craig Stedman

Time keeps on slipping, slipping, slipping into the future for IBM's mainframe disk arrays. And that means System/390 users should see disk prices falling, falling, falling during 1996.

IBM confirmed that a promised third generation of its Ramac array won't ship until the first quarter of 1997, six months later than users were led to expect. In a domino effect, IBM's futuristic Seastar family of multiplatform and fault-tolerant RAID devices is being pushed to the end of 1997.

Seastar, which was originally due in 1996, is IBM's great hope for stealing technical leadership

**IBM,** *page 105*

## INSIDE


- 3Com admits it's running three to six months late in shipping key ATM products. **See story, page 4, by Bob Wallace.**
- Santa visits IS professionals across the country and gets an earful. **See story, page 4, by CW staff.**
- Telecom managers react with a mix of optimism and skepticism to the communications reform bill. **See story, page 6, by Neal Weinberg.**

**Internet Society President** *Larry Landweber says he fears the imposition of government restrictions on the 'net*

# Internet wizards keep chaos at bay

*Second in a two-part series.*

By Gary H. Anthes and Kim S. Nash

The Internet often seems mysterious, chaotic and uncontrolled — the last place users want to put mission-critical business applications.

But the popular image of this hugely distributed network as the height of anarchy is overblown.

While it's true that no single entity controls the Internet, its future is being guided and nurtured by an increasingly well-organized army of network wizards.

These wizards are part of the Internet Engineering Task Force and several companion orga-

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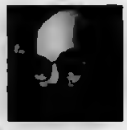

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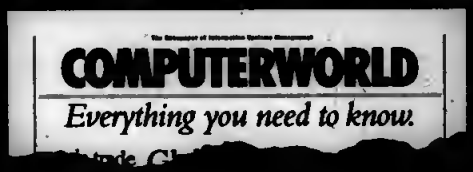
COMPUTERWORLD
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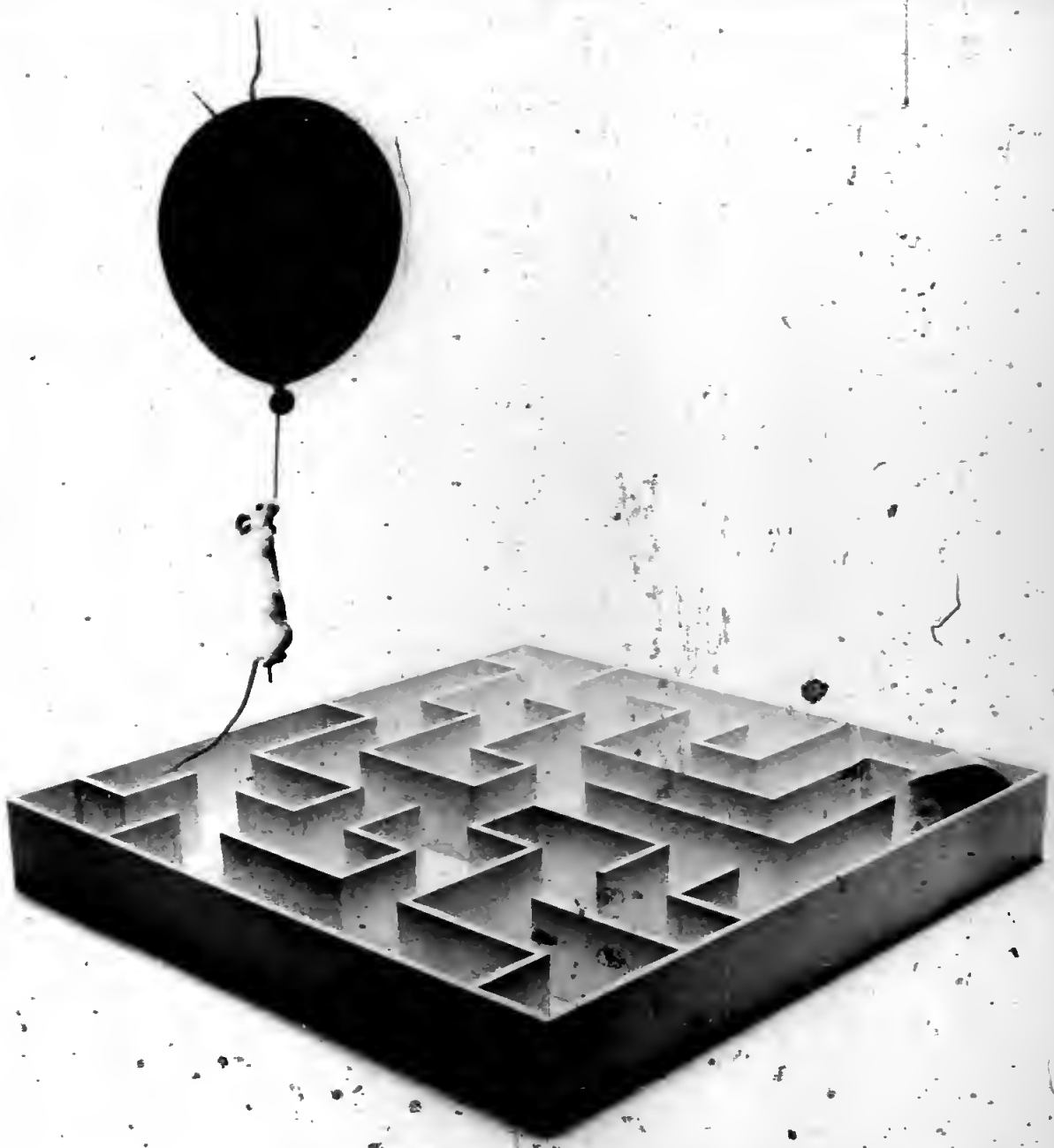

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# 3Com late with key ATM products

By Bob Wallace

3Com Corp. customers looking to use Asynchronous Transfer Mode (ATM) technology in their enterprisewide internetworks will have to wait three to six months now that the vendor has missed ship dates for several key ATM products.

A 3Com official confirmed that the company had planned to ship ATM uplinks for two switches, ATM switching for one of it hubs and a Peripheral Component Interconnect (PCI) adapter card by the eod of December. But those plans have been moved back by "one or two quarters."

**Switching**

"We want to deliver very reliable and very robust ATM products, and we couldn't do that in the time frame we originally set," said Amir Ledad, director of ATM marketing at 3Com. "We want to go out with the feature set that best suits our customers' needs."

ATM is a fast emerging, high-speed networking technology that analysts agree is the foundation for next-generation internetworks. It provides sorely needed bandwidth to relieve congestion in backbone networks.

3Com is late with ATM uplinks for its midrange LANplex 2000 switching hub and high-end LANplex 6000 data center switching hub. That means those hubs can't be linked at 155M bit/sec. to backbone networks and servers.

From a competitive standpoint, Cisco Systems, Inc. has been shipping an ATM uplink for its Catalyst 5000 since last summer. Cabletron Systems, Inc. will ship ATM uplinks for MMAC-Plus early in 1996.

One LANplex 6000 user expressed anger about the delays.

"If that's the game they're going to play, we'll just get the most out of our infrastructure, and once it's written down, we'll throw it out and buy something else from someone else," said Steve Lopez, information systems manager at the National Board of Medical Examiners in Philadelphia. He said he has six LANplex 6000s and has long pressed 3Com for the ATM uplink.

Another user has been waiting for the ATM uplink as part of a project to link LANplex 6000s to an ATM backbone network that will replace the firm's Fiber Distributed Data Interface backbone.

"We're putting significant pressure on 3Com to deliver that uplink ASAP, and they understand that they're not the only vendor in town," said Virgil Palmer, manager of telecommunications, engineering and research at Air Products and Chemicals, Inc. in Trexlertown, Pa. "We're keeping their feet to the fire because it's a critical product."

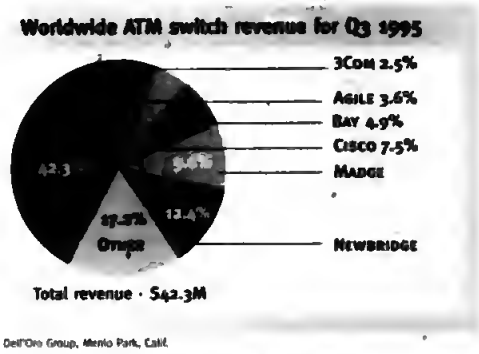
Also behind schedule is LAN-to-ATM switching for 3Com's LinkBuilder MultiServices Hub, which is used on floors within a building to support multiple high-speed switching technologies.

3Com in the oot-too-distant future will ship an ATM PCI adapter that supports data transmissioo at 155M bit/sec. over fiber-optic cable, Ledad said.

Analysts speculated that the delays may be due to 3Com reassessing its ATM strategy after its recent acquisitioo of Chipcom Corp.

"3Com is at war with itself as are companies after major acquisitions," said Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. "This lateness is probably because they're deciding whether to pursue Chipcom's ATM strategy, which is solid."

Chipcom already has high-end switching hobs with ATM uplinks; the 3Com side of the bouse doesn't. The former also has other ATM wares, such as 25M bit/sec. ATM adapters, that the latter doesn't, Nolle said.




Source: Dell'Oro Group, Menlo Park, Calif.

User mixes vendor wares to build WAN. See page 67.

# IS making that list and checking it twice

## Dreams of ease of use, openness dance through systems managers' heads

By Computerworld staff

**"I want six integrated applications that work right out of the box, five gold consultants, only four calling users, three more months, two SAP Basis gods and another test machine in a pear tree."**

***—Ralph Fusco, data centre manager at Schindler Elevator Corp., Morristown, N.J.***

• • •

On Gates! On Ellison! On Frankenberg and Geratner!

Step lively, Platt! Get going, Pfeiffer and Palmer!

This holiday season, information systems managers are sizing up vendors and checking them thrice, and in the process they have come up with a doozy of a holiday season wish list.

They want sophisticated technology that is easy to install, won't bankrupt the budget and gives results that are simple for end users to comprehend. Oh, and by the way, they would like all that delivered under the "open systems" label.

A random poll of IS professionals across the country elicited a cry common to the industry: Make our jobs easier, and we promise to be good to you io 1996.

Take, for instance, Geoff Schultz, president of UltraNet Communications, Inc., an Internet service provider in Marlboro, Mass. He is looking for a way to better manage the dozens of communications lines hooked into his Digital Eqoipment Corp servers.

"I'd like the industry to bring us a box with a T1 line inside, with 24 digital modems and a communications server built in to one box, with an Ethernet coming off the back. Then I'd only have two pieces of wire to worry about," Schultz said. If offered at a reasonable price, "I'd buy a lot," be said.

Give Sandra Harrell, corporate LAN administrator at Crestar Financial Corp., a portable network medicine bag she can carry around to diagnose and fix problems at her firm's offices in Richmond, Va.

"I'd like a fully loaded laptop with a LAN analyzer on it, so I can run around [the company] and look at LANs," Harrell said. Her departments use Novell, Inc.'s NetWare. She added that some new advanced switches from Bay Networks, Inc. wouldn't hurt, either.

And Steve Austin, MIS manager at Helicopter Support, Inc. in Orange, Conn., is wishing for "a fully debugged, 32-bit operating system that readily installs, runs right out of the box and works with all our 32-bit applications." If his wish were fulfilled, "we'd be ecstatic."

Along with the practical, there were the covetous, such as the Digital VAX user looking for a new chip to clear his aging system's processing bottlenecks. Or the HP 3000 user who needs the kind of digital audio tape autoloader from Hewlett-Packard Co. that his Unix-based HP 9000 user-cousins already have. "That would make life much better here," said Michael Kapsack, systems manager at B. F. Goodrich Co.'s Aircraft Integrated Systems division in Vergennes, Vt.

There also were the visionaries.

David R. D. Mcfarlane, World Wide Web manager for securities broker Salomon Brothers, Inc. in New York, said he wants a technology that combines the ease of use of an executive information system with the data access of a query tool and the Internet on-ramp of a Web browser.

"You wouldo't have to tell it where to find the information you want. It would already know, or it would know how to find out," Mcfarlane explained.

"The technology isn't there yet for this, though it's coming — but probably not by Christmas Eve," be added.

Of course, some holiday gift requests fell into the realm of sheer fantasy. For example, "I'd like a brand new operating system called GOS — God's operating system — something that never goes down," said John Paulsen, operations manager at *The Kansas City Star* in Kansas City, Mo.

And from an IBM mainframe user, a gift wish worthy of Charles Dickens' Tiny Tim character from "A Christmas Carol": "I hope to see a perfectly satisfied and content end user. It's one of those things that's hard to get in [information technology]. They always want something else," sighed Michael Puldy, manager of resource management at Barnett Banks, Inc. in Jacksonville, Fla.

Users also have a wish list for Microsoft. See page 61.

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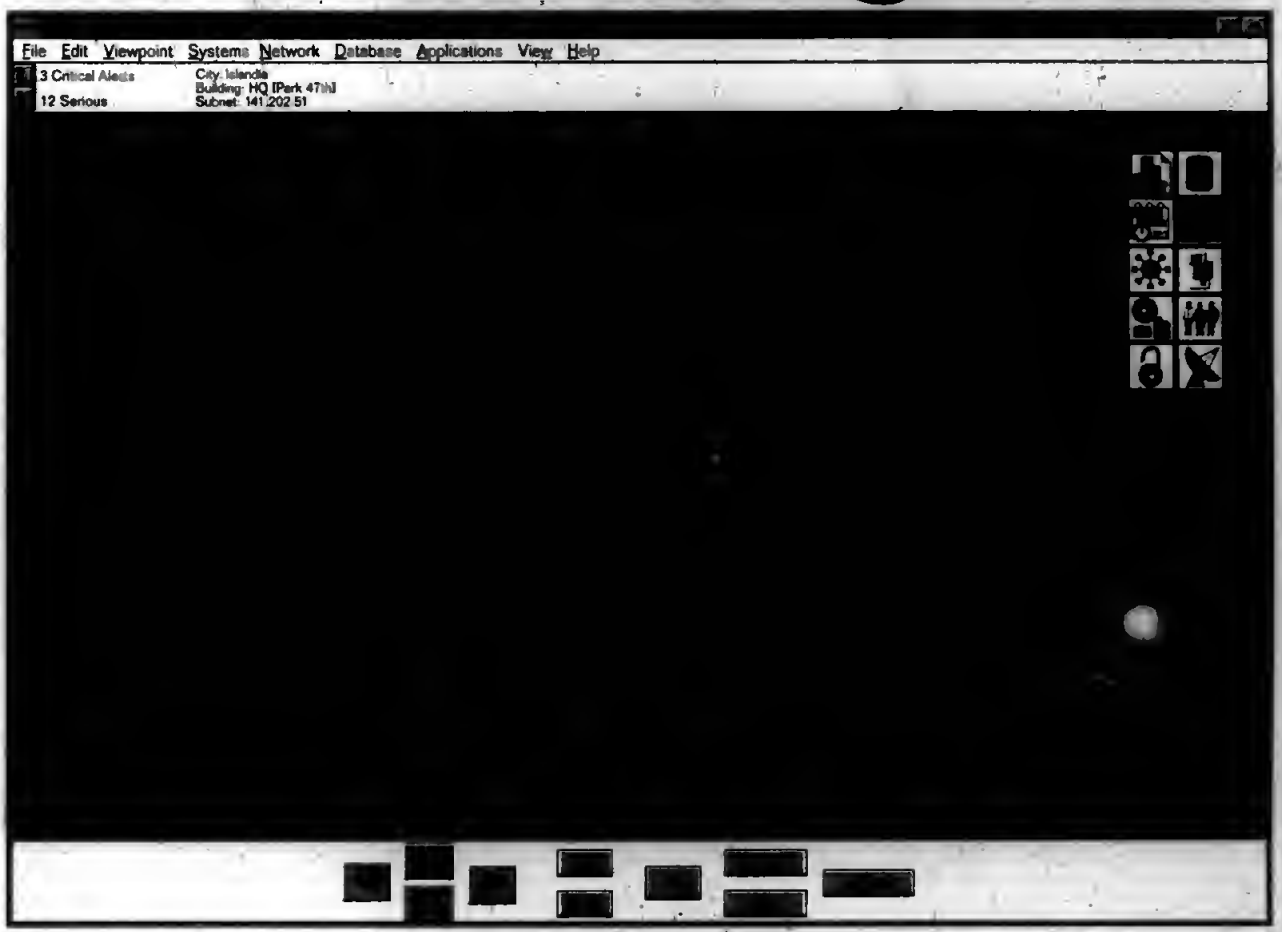


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# IS skeptics greet telecom law

## Managers ponder benefits of reform vs. loss of local focus

By Neal Weinberg

Politicians are hailing communications reform as a boon to consumers, but veteran telecommunications managers are taking the news with a healthy dash of skepticism.

The reform would let cable companies, long-distance carriers and local telephone companies enter one another's markets. Legislation was pending at press time.

"This will unleash a new era in the telecommunications revolution and speed completion of the information superhighway," said Vice President Al Gore.

"I'll believe it when I see it," countered Donna Adkins, communications analyst at NACCO Materials Handling Group, Inc. in Portland, Ore. Adkins said increased competition theoretically should lead to lower prices, but somehow it doesn't always work that way.

Telecommunications managers all say they want the law to bring lower prices and more services. There is division in the ranks, however, on whether those benefits will materialize.

William J. Johnson, director of telecommunications at F. W. Woolworth Co. in Milwaukee, said he supports the reform effort. He said Woolworth's 5,800 locations in the U.S. are "at the mercy of local operating companies."

Johnson said he anticipates lower prices for local phone service when long-distance carriers and cable operators jump into the local market.

And he said he is looking forward to increased availability across the country of high-speed data services such as frame relay and Integrated Services Digital Network.

Matthew O'Brien, president of Communication Managers of America, said his members support the need for competition, but worry that local service will deteriorate when regional Bell operating companies turn their attention toward the long-distance market.

Nynex Corp. and Bell Atlantic Corp. already are discussing a merger. Pacific Telesis Group apparently is trying to negotiate alliances with other regional Bells.

### Dose of skepticism

Ray Sheedy, director of corporate telecommunications at Walgreen Co. in Deerfield, Ill., said his company is looking forward to telecommunications reform, but he isn't expecting miracles, either.

Sheedy said Walgreen's has more than 2,200 stores nationwide, many of them in rural areas. He said he expects to reap savings at the corporate campus and large distribution centers because the battle for local phone service will be fought at the major population centers. But it will probably be years before he sees any benefits at his outlying stores, he said.

"The fundamental bill is extremely advantageous to universities because we have been paying extremely high local telephone rates," said Michael Roberts, networking vice president at Educom in Washington, an association of information systems specialists at colleges and universities.

Roberts also hailed provisions in the bill that he said would stimulate the development of new technologies, especially interactive broadband services.

*Senior editor Gary H. Anthes contributed to this story.*

# Notes users hungry for beefy upgrade

By Tim Ouellette

Notes 3.0 users are raring to dig into the 4.0 upgrade, which is now shipping.

The latest revision of the popular groupware package sports a slew of key upgrades and will gain World Wide Web integration by mid-1996, as promised by Lotus Development Corp. in December.

"We are looking at deploying 4.0 close to right out of the gate," said Tim M. Crawford, information access manager for Notes at National Semiconductor Corp. in Santa Clara, Calif.

"We will start to convert the servers over, then have some early users prototype the 4.0 client, then migrate after that as fast as we can," said Jeff Held, a partner at Ernst & Young's Technology Services Practice in New York.

Users were most interested in the forthcoming Web integration, the addition of client/server Notes Mail and many ease-of-use enhancements (see chart). Other major additions include workflow routing and tracking, Notes application programming interfaces for LotusScript, C++ and Microsoft Corp.'s Visual Basic and support for field-level data replication.

### Speed issues

Citing some concern with the speed of the beta version, Lotus officials admitted that processing speed was the final item on the checklist before Version 4.0 hit the streets.

But users and analysts said Notes 4.0 was much faster than Version 3.0, especially with symmetrical multiprocessing (SMP) server support and field-level replication.

"We are absolutely going with the SMP-based servers," Held said. "The biggest problem now [with Version 3.0] is managing the number of servers you need for a large deployment." Ernst & Young manages about 200 Notes servers but could reduce that number because Version 4.0 supports up to 1,000 active sessions on a Windows NT or Unix SMP server.

On the other hand, field-level replication lets users replicate only the changes made in a database rather than the entire database. This saves time replicating from server to server or from servers to mobile users (see story at right). "Now when I replicate one particular item, it costs a lot less to do it," said David Marshak, an analyst at Patricia Seybold Group in Boston.

Overall, users said they agree the interface is quite an improvement over Version 3.0, though the three-paned format fills the screen with so much information that some users expect to upgrade to larger monitors. Such a move would add to the cost of upgrading to Version 4.0.

"The user interface is going to be a big win for us. And the integrated Web browser — they did a really slick job on it," said Kevin Danahy, manager of workgroup application development at Millipore Corp. in Bedford, Mass. Millipore expects to add as many as 400 Notes users this year to its 1,500 Notes users worldwide.

Lotus' recent decision to embrace Web technology [CW, Dec. 18] and cut Notes prices will give users a lot to think about.

However, much depends on whether the Cambridge, Mass.-based division of IBM can deliver solid integration with Internet protocols such as Hypertext Transport Protocol and languages such as Hypertext Markup Language and Sun Microsystems, Inc.'s Java.

"We are a huge user of the Web internally and externally, but we are looking at Notes to coexist," Crawford said. "The Web integration is definitely a hot button issue with us."

**Ringing in the New Year**

**Key features in Notes 4.0:**

- Three-pane user interface to browse through documents
- Workflow routing and task management
- Agent builder to automate tasks such as data handling and replication
- Hot spots that act as hyperlinks between Notes documents and/or Web pages
- Notes application programming interface extension for Macintosh
- Built-in Web publisher and browser

# Critics cheer mobile muscle of new Notes

By Mindy Blodgett and Tim Ouellette

Industry observers are applauding the enhanced mobile support capabilities and remote access improvements in Lotus Development Corp.'s Notes 4.0.

They particularly laud the selective replication feature, which offers an easy-to-use point-and-click dialog box. It gives a remote user access to Notes' location profiles, which store and "remember" connection instructions, and special mail and document preferences for replication.

Also added is field-level replication, so only changes to a Notes database are replicated. This cuts downloading times and connection charges. That is a big plus for Kevin Danahy, manager of workgroup application development at Millipore Corp. in Bedford, Mass. "You can set up all sorts of replication scenarios" for specific locations, he explained. "It is a really user-friendly, point-and-click process for the user."

Notes 4.0 "finally allows end users to define selective replication on a very simple level," said Tom Austin, an analyst at Gartner Group, Inc. in Stamford, Conn.

Austin, who has been testing Notes 4.0, said he uses the replication feature to set up location profiles for European and American hotels.

"I can say that I only want to receive replicated information pertinent to a different set of subjects [than] what I receive while at American hotels," he said.

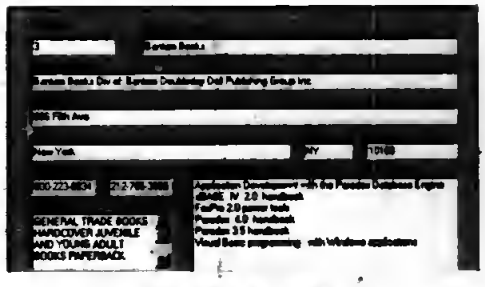
"With the old version, you had to be a wizard to accomplish selective replication schemes. In 4.0, there are agent capabilities that mere mortals can do just by pointing the mouse," Austin said.

"Lotus has really set the pace for the quality of general nomadic support, and the new features [in Notes 4.0] allow them to extend their lead over competition [such as Microsoft Corp.], which recently snuck some nomadic support features into [as yet unshipped] Microsoft Exchange," he said.

**A new approach** to sales force automation may ease the process. See page 62.

# Database Developer Productivity Comparison

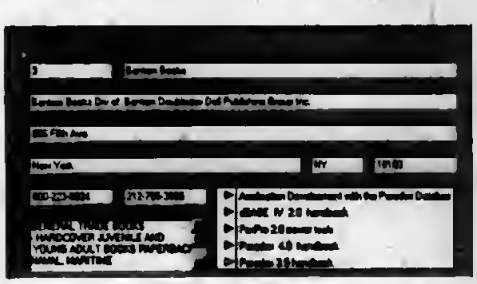
## Visual Basic 4.0



**26 LINES OF CODE. AND STILL NO INSERTS. NO DELETES. NO QUERIES.**

```
Sub ListPubsTitles()
   Dim Qry As String

   Qry = "SELECT DISTINCTROW Titles.Title FROM Titles"
   Qry = Qry + " WHERE (Titles.PubID=" + txtPubs(0).Text + ")"

   dcPubsTitles.RecordSource = Qry
   dcPubsTitles.Refresh

   lstPubsTitles.Clear
   If dcPubsTitles.Recordset.EOF Then
      lstPubsTitles.AddItem "No titles for this publisher."
   End If
   Do While Not dcPubsTitles.Recordset.EOF
      lstPubsTitles.AddItem dcPubsTitles.Recordset(0)
      dcPubsTitles.Recordset.MoveNext
   Loop
End Sub

Private Sub lstPubsTitles_Click()
   Dim BM As Variant
   BM = dbCtrl(Titles).Recordset.Bookmark
   dbCtrl(Titles).Recordset.FindFirst _
      "Title = """+ lstPubsTitles.List(lstPubsTitles.ListIndex) + """
   If dbCtrl(Titles).Recordset.NoMatch = True Then
      dbCtrl(Titles).Recordset.Bookmark = BM
   Else
      DisplayGroup_Click (Titles)
   End If
End Sub
```

## Oracle Power Objects



**3 DRAG AND DROPS**

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All other company and product names are the trademarks of their respective owners The Visual Basic application is the "Biblio" example which shipped with Visual Basic V4.0 Enterprise edition The Oracle Power Objects application is a direct implementation of "Biblio."

# SSA recasts software strategy, object plans

By Julia King

Weeks after being slapped with a fraud lawsuit by a prominent user, System Software Associates, Inc. (SSA) is on the offensive.

The Chicago-based vendor is shining the spotlight on its Unix progress, new object technology and a new set of user-configurable financial applications due in January.

The financial applications will be integrated into SSA's Business Process Control System (BPCS) manufacturing package, and a new object-based order management module will follow in February, *Computerworld* has learned.

SSA said by the end of 1996 it will convert all BPCS modules to the object-based technology, which runs on AS/400 and Unix platforms.

### Mixed environments

SSA introduced a Unix version of BPCS last March. Before that, its software ran only on AS/400 computers.

"We don't expect any customer that has our stuff on AS/400 to throw that AS/400 away and get Unix," said CEO Roger E. Covey. "They can mix and match AS/400 and Unix today, and they can get the new object technology on AS/400."

SSA demonstrated the object technology to industry and financial analysts in December, at a hastily arranged briefing following the lawsuit filed against SSA by Owens-Illinois, Inc. in Toledo, Ohio [CW, Dec. 4]. Owens-Illinois has accused SSA of fraud and deceptive business practices related to, among other things, a promised but long-overdue Unix version of BPCS for the Sybase, Inc. relational database management system.

**SSA President Terry Osborne** *says the goal is to provide customers with the flexibility of reusable, reconfigurable software objects*

Covey said SSA will deliver the Sybase version of BPCS this spring.

At the briefing, SSA failed to deliver on its promise to produce customers in person who would talk about their Unix-based applications. Analysts instead were shown brief videotaped presentations and heard telephone interviews with executives at companies that have purchased the Unix version of BPCS.

Among these companies is $85 million International Envelope Co., which is implementing BPCS Unix on a Hewlett-Packard Co. HP 9000 platform and Informix Corp. database.

"One of the first things we liked about SSA is that we could afford it," said George Weiner, director of information systems at International Envelope. "We called SAP, but for any company that doesn't have deep pockets, SAP is not really an alternative."

In reality, license pricing of software from SAP America, Inc. and SSA is quite comparable, said Bill McSpadden, president of Plantwide Research Group, Inc., a manufacturing software research firm in North Billerica, Mass.

The bigger issue is the cost of implementing SAP's R/3 client/server modules, which McSpadden said can cost between $5 and $10 for every $1 spent on the software. SSA claims that BPCS implementation, by contrast, costs between $1 and $2 for every software dollar spent.

SSA's new object technology also "leapfrogs" R/3's technical capabilities, McSpadden said.

SSA has developed an object tool set that complies with the Common Object Request Broker Architecture. SSA is using the tool set to gradually generate object-based code for its BPCS applications. Object-ready applications initially will run in AS/400 and Unix operating environments. Windows NT code will be delivered next year, said Terry Osborne, president of SSA.

"We're sheep dipping the whole company in object technology," Osborne said. He said the company's goal is to give customers the flexibility of reusable, reconfigurable software objects.

In 1995, about 130 object experts joined SSA's 500-member development team when it merged with Softwright, a leading object-based software company in the U.K.

**System Software Associates**
*Chicago*

**1995 Revenue:** $394.4M

**Products:** Enterprise client/server-based Business Process Control System software for industrial companies

**Platforms supported:** AS/400, HP 9000 and RS/6000 Unix machines. Will support Windows NT next year.

**Databases supported:** IBM, Informix and Oracle

**Implementations worldwide:** 8,000

**Unix-based implementations:** 100

**Unix installations in production:** 6

## News Shorts

### Galileo pulls plug on Covia

Sources close to **Galileo International** said the company is pulling the plug on its **Covia Technologies** unit, which was one of the message-oriented middleware pioneers. The move is due largely to competition from IBM's MQSeries software. Covia, based in Rosemont, Ill., shut down as of Dec. 31, although its Communications Integrator software will still be used in Galileo's on-line reservations system.

### Partners shut down Taligent

**Apple Computer, Inc.** and **Hewlett-Packard Co.** are giving up their stakes in **Taligent, Inc.** **IBM** will get sole custody of Taligent, which will remain based in Cupertino, Calif. It will continue to develop object technologies that will be integrated with many of IBM's offerings.

### Notes 4.0 delayed

**Lotus Development Corp.** will delay general shipment of Notes 4.0 until the product's official release at Lotusphere '96 in Orlando in January, sources close to the company said. Lotus officials stuck with their Dec. 28 target date when questioned last week. But sources said that while a few copies were to ship then (see story, page 6), large quantities will not hit the streets until mid-January.

### Greetings to Bosnia

The Pentagon has added an electronic-mail form on its BosniaLink World Wide Web page (http://www.dtic.dla.mil/bosnia/) that lets users send a general message to U.S. soldiers through a Web browser.

### ARDIS slashes prices

The **ARDIS Co.** in Lincolnshire, Ill., will lower air-time costs and increase technical support for developers writing wireless applications. The minimum monthly charge per wireless device will drop to $5, down from $20.

### Internal Web search

Waterloo, Ontario-based **Open Text Corp.** will bundle its popular search engine with **Netscape Communications Corp.**'s Web browser and servers. The bundled Latitude Web Server will ship in January, with prices starting at $12,000. It is aimed at information systems managers building internal Internet or intranet applications.

### Workstation sales leap

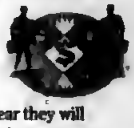
The worldwide workstation market grew by 24% in 1995, led by **Sun Microsystems, Inc.**, according to International Data Corp. Intel-based workstations sales grew 148%; Windows NT versions accounted for 79% of that total.

### Polishing up Platinum

**Platinum Technology, Inc.** in Oakbrook Terrace, Ill., has integrated chargeback functions for its systems management tools and announced plans to adapt some of them to the Spectrum distributed enterprise network management platform from **Cabletron Systems, Inc.**

### Informix buys Illustra

**Informix Software, Inc.** in Menlo Park, Calif., has bought **Illustra Information Technologies, Inc.**, an Oakland, Calif., vendor of software that manages nontraditional data, for about $380 million in stock. The vendors said within a year they will merge their products to let users store and manipulate spatial, video, text and other noncharacter, nonnumeric data in Informix's relational database management system. Details of upcoming products will be released Feb. 6.



### Sterling spins out unit

**Sterling Software, Inc.** in Dallas plans to spin off its electronic commerce division into a separate firm called Sterling Commerce. The unit accounted for 37% of Sterling's revenue and 46% of its profits during its fiscal year ended Sept. 30. Initially, 16% of Sterling Commerce's shares will be sold on the open market; Sterling Software will hold on to the rest.

### Ascend goes to the MAX

**Ascend Communications, Inc.** has announced MAXLink, client software that will enable a remote DOS or Windows-based PC with an analog modem or Integrated Services Digital Network terminal adapter to become a node on a corporate network. The software comes bundled with Ascend's MAX 200. Prices range from $500 to $2,500.

### Lawsuit bill vetoed

President Clinton vetoed a bill aimed at curbing "abusive" shareholder lawsuits. High-tech firms, whose often-volatile earnings have invited many such lawsuits, lobbied hard for the legislation.

### CICS for Sinix

Via its Web page, **IBM** formally introduced a version of its CICS transaction processing software for **Siemens Nixdorf Informationssysteme AG**'s Sinix operating system, set to ship in late March. IBM plans to add support for Sun's Solaris in 1996.

**SHORT TAKE** **Samsung Group** has increased its stake in money-losing PC maker **AST Research, Inc.** to 45% from a current level of 40.25%. As part of the move, Samsung will double its present line of credit with AST to $200 million.

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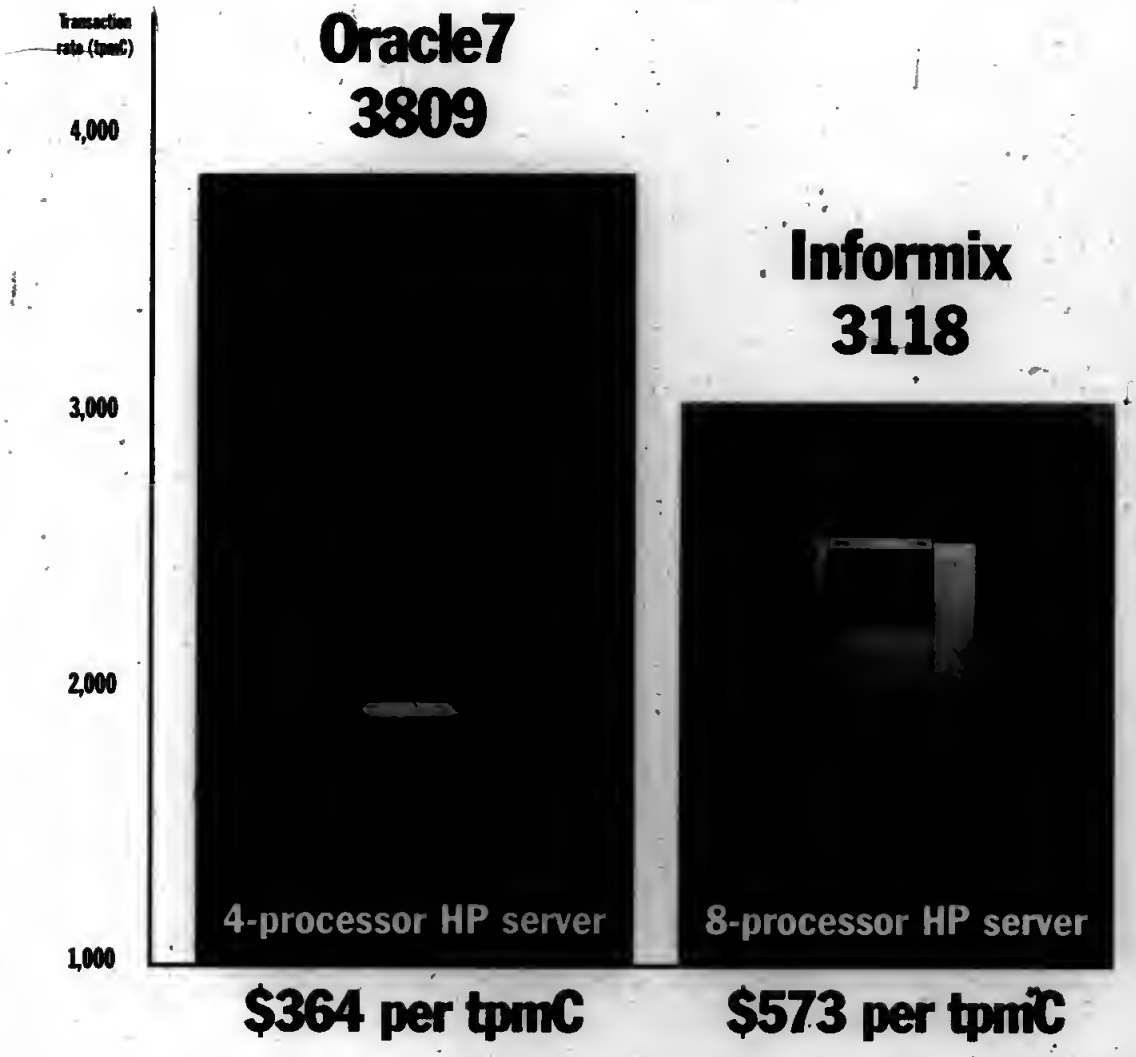


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# Pentium lure sends PC sales soaring

By Jaikumar Vijayan

**Widespread corporate migration to Pentium technology, combined with a boom in demand from the small business and home markets, fueled higher-than-anticipated PC sales in 1995.**

That growth is expected to continue through 1996 as corporations continue their migrations and hardware upgrades. But it could begin to slow down a bit in 1997, analysts said.

Overall, U.S. PC shipments achieved a year-over-year growth rate of 22% in 1995 instead of the 15% that had been projected, according to early estimates from International Data Corp. (IDC) in Framingham, Mass. IDC pegged the total number of PCs sold in 1995 at 22.8 million, compared with the 18.7 million shipped in 1994.

Leading the pack was Compaq Computer Corp., which managed to just barely hold on to its No. 1 spot in the U.S. The Houston-based company shipped an estimated 2.7 million PCs in 1995, a hairbreadth in front of PC retail giant Packard Bell Electronics, Inc., which closed the year with 2.66 million units shipped.

A strong Pentium push in the business sector from vendors such as Hewlett-Packard Co., Dell Computer Corp., Compaq and IBM helped build strong growth in the business market, said Bruce Stephen, an analyst at IDC. In 1994, most of the vendors had focused on Intel Corp. Pentium-based systems for the consumer market.

Also fueling strong Pentium sales were the many people who began buying abuve their current needs in anticipation of migrating to Windows 95 and Windows NT environments, said analyst John Dunkle, president of Workgroup Strategic Services in Portsmouth, N.H.

Because most of those migrations will occur throughout 1996, analysts expect that the strong commercial PC growth will continue through the year.

"We are looking at an ongoing transition in 1996. Any new systems we buy [in 1996] will be at least 133-MHz Pentium. And if they reach appropriate price points, we will also consider Pentium Pro systems," said Linda Rudawitz, MIS manager at Holmes & Narver, an architectural firm in Orange, Calif.

### Slumping profits

Despite the higher-than-expected PC sales, chip maker Advanced Micro Devices, Inc. predicts its fourth-quarter profits will fall below expectations due to disappointing 486 sales. The Sunnyvale, Calif., company, which makes most of its profit from 486 clones, said it was hurt by a 486 push by rival Intel.

### Corporate needs

The availability of high-end Windows NT-based Pentium Pro systems toward the end of 1996 could increase corporate demand somewhat, but it is unlikely to contribute significantly toward mass volumes, analysts said.

However, the growing corporate interest in NT is expected to trigger a flurry of lower-end, Windows NT-based Pentium PC announcements in the first half of 1996, according to some vendors. The systems, most of which will come with at least 16M bytes of RAM and 1.5G-byte hard disks, are expected to raise average PC prices in 1996.

Meanwhile, analysts say the small business and home office markets continue to be the fastest-growing segment for PCs. According to estimates from IDC, more than 40% of all PCs and portables shipped in 1995 were in these segments.

**Users rate reliability** most important when purchasing PCs. See page 61.

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# Who's in charge of the 'net?

CONTINUED FROM PAGE 1

nizations, where more than 1,000 volunteers from industry and academia meet regularly to develop technical standards for the 'net (see story below).

Working in parallel with these engineers is a growing cadre of businesspeople and developers, organized into groups such as CommerceNet and the World Wide Web Consortium. Their mission: to make Internet-based commerce a reality.

Unfortunately, a third group — the telephone companies and Internet service providers — hasn't done enough to make the Internet seamless and robust, networking experts and users agree.

On the Internet, there is no one person or organization to call if something goes wrong.

"It used to be, when the National Science Foundation ran the Internet backbone, it was relatively easy to do problem resolution," said Scott Bradner, vice president for standards at the Internet Society. Users could simply call the NSF backbone operator with questions.

But now that the NSF has eased itself out of the backbone business, several separate companies — long-distance carriers such as AT&T Corp. and MCI Communications Corp. and Internet access providers — handle end-to-end data communications.

So self-reliance has become the watchword for users such as Eli Lilly & Co., which has been on the 'net since 1991. "You've got to be prepared inside your own company," said John Schwartzendruber, a technical manager in the Internet Services Group at the Indianapolis-based pharmaceutical firm.

He advised against putting any significant applications on the Internet or the Web — either internally or externally — until a smart help desk and solid technical team are assembled.

### Under IS control

At Eli Lilly, for example, the information systems group has taken firm grasp of the Web reins. Marketing, finance and other departments contribute data to the firm's various Web sites. However, a six-member IS team controls the technical direction of those applications by providing the groups with a kit of IS-sanctioned Web development tools and utilities, Schwartzendruber said.

Further, users want Internet service providers to become their Internet point guards, said one webmaster at a major manufacturing and consumer products firm in Richmond, Va. Internet service providers "should be held accountable for the availability of the network just as the phone company must make sure I get a dial tone whenever I pick up the handset," he said.

In fact, some Internet service providers are offering to shoulder certain burdens for users.

For example, BBN Planet Corp. in Cambridge, Mass., sells a soup-to-nuts service that includes network management and security, operation and maintenance of customers' Web servers, a 24-hour help desk and end-to-end problem diagnosis.

"But BBN Planet does not cover the planet," Bradner said. "I can call their hot line and say, 'My E-mail is not getting to Albuquerque,' and they can go off and figure out why that is the case, but it doesn't mean they can fix it."

Nevertheless, Bradner conceded that BBN Planet goes further than many Internet service providers in its attempts to diagnose and solve problems. Some smaller providers don't have the staff to diagnose every problem that arises and may not have expertly staffed 24-hour hot lines. Others offer limited guaranteed security.

"It's a terribly difficult and expensive thing to do right," Bradner said.

The monthly cost for Internet access via a 56K bit/sec. leased line varies from about $300 to more than $1,200, depending on support and other services.

Beyond the issue of finding the right service for Internet caretaking lies a bigger problem, however. Poor coordination between the major telephone companies and Internet service providers is an obstacle for users, said Phill Gross, director of Internet marketing services at MCI in Reston, Va. "There needs to be some agreed-upon procedure for end-to-end troubleshooting," he said.

But that's not happening, Gross added.

### SIM converts

Still, some users are slowly beginning to trust the Internet — even those who once predicted its collapse. The influential Society for Information Management (SIM) is one example.

Several years ago, SIM members openly predicted the decline and fall of the 'net. But now, growing numbers of them are more comfortable hooking up to the information superhighway, said Raymond H. Hoving, vice president for issues advocacy at SIM.

Larry Landweber, president of the Internet Society, said users who are worried about issues such as security and reliability should get involved as volunteers in the standards-setting process.

Particularly crucial are standards for network management and methods for expanding the Internet's infrastructure, Bradner said. Without clear rules for how to use and care for the Internet, users could see a splintered network controlled by uncooperative commercial entities, he noted.

### Record leap

In the four-week period ended Dec. 8, the number of commercial, or .com, domains on the Internet jumped 13%, to 152,000. That's the highest monthly growth rate to date, according to Internet Info in Falls Church, Va. For more statistics, visit http://www.web-com.com/walsh/.

### Who's in charge

Groups contributing to the architecture and use of the Internet:

| Organization | Description/Mission | Number of members/ Annual budget |
|---|---|---|
| Internet Society http://www.isoc.org | Is concerned with the evolution of the Internet and its social, political and technical issues | 5,000 members in 120 countries/$1.4 million |
| Internet Engineering Task Force http://www.ietf.cnri.reston.va.us/home/html | Develops technical standards for the Internet | More than 1,000 active participants/ $1.1 million |
| Internet Architecture Board http://www.iab.org/iab/ | Oversees Internet protocols and procedures and the creation of Internet standards | 15 volunteers/No budget |
| Internet Assigned Numbers Authority http://www.isi.edu/div7/iana/ | Coordinates assignment of Internet parameters, domain names and Internet addresses | Not applicable/Minimal |
| Commercial Internet Exchange Association http://www.cix.org/CIXhome.html | Nonprofit trade association for public data internetworking service providers | 180 members/$1.4 million |
| World Wide Web Consortium http://www.w3.org/pub/WWW/ | An industry consortium run by MIT that develops standards for the evolution of the Web | 105 U.S. and foreign companies/$2.9 million |
| CommerceNet http://www.commerce.net/information/about.html | Nonprofit group that works to accelerate the application of electronic commerce on the Internet | 135 members/$4 million |

## Chaos with a hint of order

Yes, it's true. No one is in charge of the Internet.

Even Larry Landweber, president of the Internet Society, admits that. "But anarchy? That is incorrect," he said of the other popular belief — that no one maintains law and order on the 'net.

In reality, a number of dedicated volunteer groups keeps the Internet working through their efforts at standards development and consensus building, Landweber explained. They include the Internet Society, the Internet Engineering Task Force (IETF) and the Internet Architectures Board.

"The technical standards developed by the IETF are critical because they eliminate the argument that there is anarchy," said Landweber, who is also a computer science professor at the University of Wisconsin.

Among the key technical standards the IETF is working on is the next generation of the Internet Protocol (IP), the cornerstone of the 'net. IP Version 6 will offer a rich variety of new services — such as enhanced security — and will greatly expand the capacity of network addresses. This new version is critical to the continued growth of the Internet.

The IETF is a group of more than 1,000 volunteers who meet three times a year.

"What's impressive about the IETF is how much they have accomplished on an ad hoc basis," said Hal R. Varian, a professor at the School of Information Management and Systems at the University of California at Berkeley. "But some feel more structure is needed in a world where so much is at stake."

While the IETF volunteers have shown a remarkable ability to forge a consensus among standards developers, the telephone companies and Internet service providers haven't done so well when it comes to operational matters.

But the solution isn't to have the Internet operators start calling the shots on standards, some users said.

Researchers and "hitherto like me" have been minding the Internet with no trouble for decades, said a webmaster at a manufacturing and consumer products firm in Richmond, Va.

*— Gary H. Anthes and Kim S. Nash*

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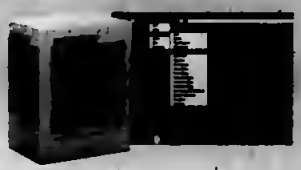

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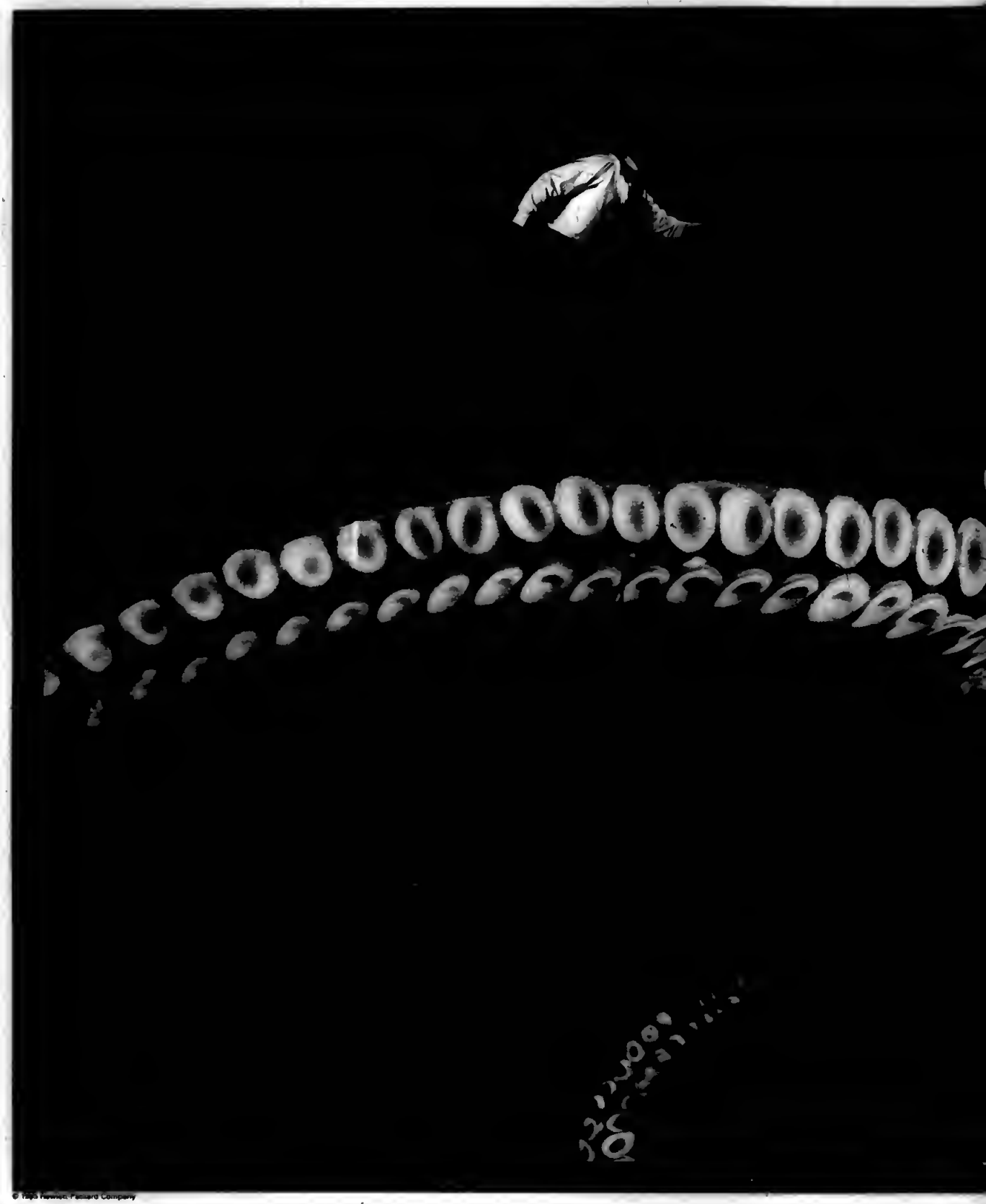

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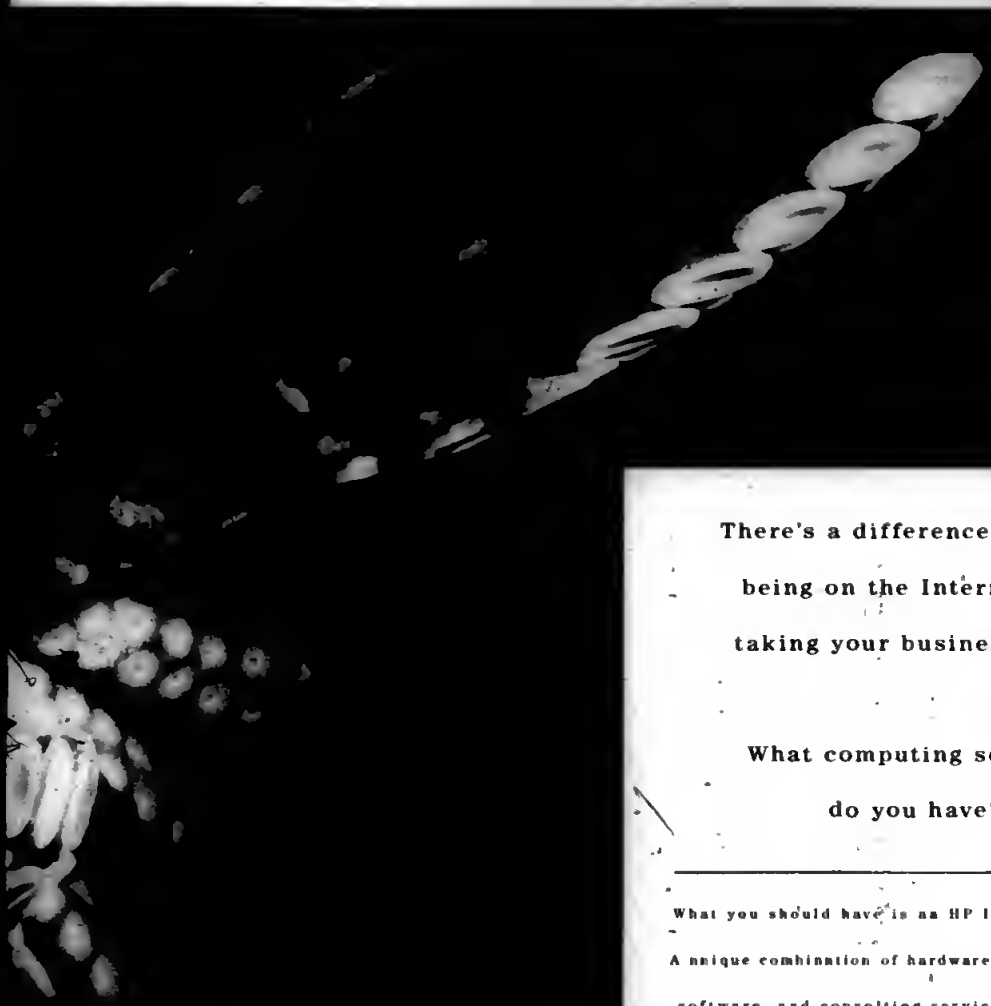

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80 Manufacturer of Computers, Computer Related Systems or Peripherals
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Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

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85 Systems Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
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13 Treasurer, Controller, Financial Officer

**DEPARTMENTAL MANAGEMENT**
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99 Other Titled Personnel

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Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

App. Development Products ❑ Yes ❑ No
Networking Products ❑ Yes ❑ No

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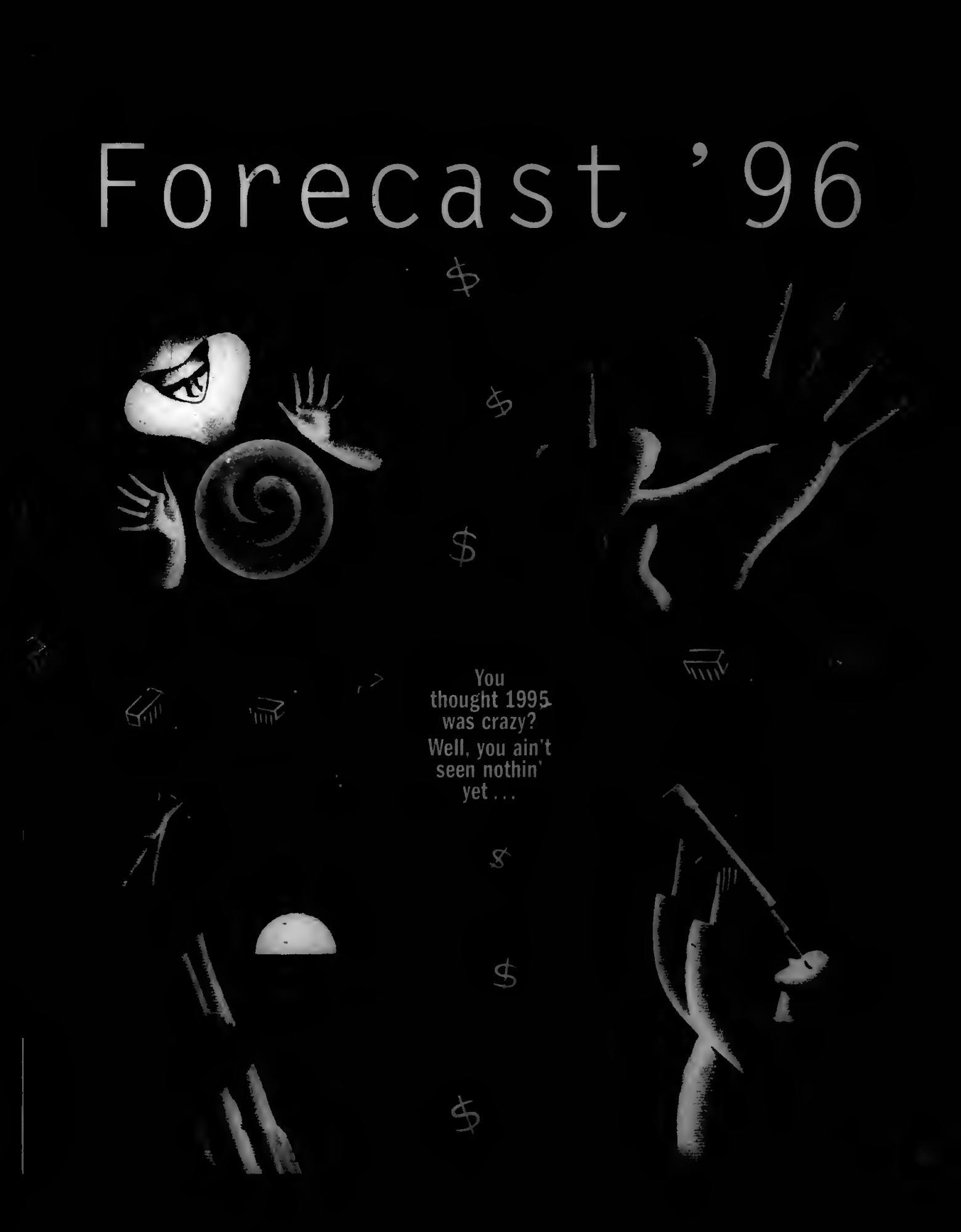

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# Editor's Note

THERE'S A RULE OF THUMB in the computer industry called Moore's Law, which is attributed to Intel co-founder Gordon Moore. It says that the amount of computer power you can get for $1 roughly doubles every 18 months.

If you calculate Moore's Law on a spreadsheet, you find that for what you would have paid for one unit of computing power in 1946, you can now buy roughly 8.5 billion units of that power. But it gets better. In 18 months, you'll get 17 billion units; in three years, 34 billion units; and so on. In other words, every 18 months, the computer industry duplicates the advances that have been made since the first commercial computer was switched on 50 years ago this spring.

Don't underestimate the effect Moore's Law has had on corporate information systems. In the past five years, computers have saturated corporate desktops. They're in more than 30% of homes. As computers become appliances, they will be integrated with our daily lives. They will help us to control other devices around us, communicate with our friends and colleagues, manage our finances, educate our children and find whatever information we need when we need it.

It sounds like magic, but it isn't. These technology marvels will come with a boatload of unsavory problems with standards, selection, deployment, training and security. IS professionals in business, government and education will solve those problems. It's an enormous and daunting responsibility. It's also an opportunity to change the world in a fundamental way. How many jobs let you do *that*?

In the following pages, you'll read about a few people and companies that are trying to change the world. Some already have done it; others are just getting started.

Their approaches are as varied as the etchings on a silicon wafer. But they have one thing in common: They know that as the millennium approaches, the IS industry is the place to be.

*— Paul Gillin*

# Computerworld Index

Eventual world market for computers, predicted by IBM Chairman Thomas Watson, 1943: **5**
1994 installed base of PCs worldwide: **200 million**

Amount consumers spent on computer software, 1993: **$2 billion**
Estimated value of Bill Gates' personal fortune: **$13.8 billion**
Bill Gates' fortune in $1 bills, laid end to end: **1,306,818 miles**
Diameter of the sun: **861,000 miles**

Total budget of Office of Technology Assessment, cut by Congress for fiscal 1996: **$22 million**
Estimated amount spent on Windows 95 marketing campaign: **$200 million**

Number of times O. J. Simpson mentioned in the press since Jan. 1, 1995: **29,219**
Number of times Windows 95 mentioned: **29,643**
Number of times O. J. Simpson and Windows 95 mentioned in the same article: **283**

Estimated number of Internet users: **5.8 million**
Average weekly viewers of *Home Improvement*: **30 million**

*Software Industry Report* estimate of total number of World Wide Web sites, August 1995: **30,000**
Business Wire estimate of total number of Web sites, August 1995: **100,000**
*Investor's Business Daily* estimate of total number of Web sites, August 1995: **4 million**

Estimated number of electronic-mail messages, 1995: **1 trillion**
Estimated number of deliveries by the U.S. Postal Service, 1995: **180 billion**

International Data Corp. prediction in 1991 of OS/2 market share in 1995: **23%**
1995 OS/2 market share: **5%**

Possible weight of a computer "in the future" estimated by *Popular Mechanics*, 1949: **1.5 tons**
Weight of IBM's ThinkPad 760CD: **7.4 pounds**

Price per pound of gold on Nov. 7, 1995: **$5,535**
Price per pound of 133-MHz Pentium processors: **$11,371**

Estimated number of computer specialty publications, 1970: **10**; 1995: **1,900**

*— Compiled by Laura Hunt and Amy Malloy*

**Sources:** *Orlando Sentinel, IEEE Spectrum, Newsweek/Forbes, The Los Angeles Times, Computerworld, Infoworld, PC Computing* "Software Industry Report," The Nine Planets Web site (http://seds.lpl.arizona.edu/nineplanets.html), Nexis searches, Defining the Internet Opportunity Web site (http://inetnet.gsn.com/gsn/bus/ots/survey/index.html), *The Hartford Courant*, Business Wire, *Investor's Business Daily*, Electronic Messaging Association, *Advertising Age*, *The Wall Street Journal*, Intel Corp. Web site (http://www-us-east.intel.com), *Network World*, *Computer Reseller News*, IBM Web site (http://www.ibm.com), *Business Marketing* Multimedia '94 in Sydney, Australia.

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With technology changing so rapidly,
new winners emerge practically overnight

# Technology Forecast

Here's a guide to what you can expect
in the coming year in 10 critical market areas

## Network operating systems

It's shaping up to be a two-man fight in the network operating system arena this year. Users can expect champion Novell, Inc., with its NetWare 4.1, to attempt to stave off No. 1 rival Microsoft Corp. and its Windows NT Server 3.51.

The other players in the network operating system market — Banyan Systems, Inc.'s Vines and IBM's OS/2 Warp Server — boast hard-core and devoted, albeit niche, user populations. But unit shipments of Vines and OS/2 Warp Server are unlikely to rival NetWare 4.1 or Windows NT Server 3.51 in the next year. All versions of NetWare command 65% to 70% market share among more than 40 million users worldwide. Windows NT Server's market share now stands at about 15%, but it is growing fast, according to International Data Corp. in Framingham, Mass. NetWare 4.1 boasts an integrated enterprise directory services database engine.

NetWare Directory Services lets businesses build complex "directory trees" of the users and objects attached to the network. That makes it easy for administrators to monitor network activities. By contrast, Windows NT Server's strength is as an applications server. After several years of trying, Novell has yet to fashion a cohesive database server applications strategy. Similarly, Microsoft has yet to deliver a full-featured enterprise directory services engine. The Redmond, Wash.-based firm has promised that functionality in its Cairo release of Windows NT Server at midyear. But businesses aren't holding their breath waiting for Novell and Microsoft to plug the holes in their network operating systems. Most users will likely chart a dual strategy — retain NetWare for file, print and directory services and install Windows NT Server as an application server. For now, the network operating system race looks like a dead heat. — *Laura DiDio*

## Database management systems

This year will see Sybase stabilize, Informix and CA innovate and Microsoft muscle in. But Oracle will overwhelm, two analysts predict. Data warehousing will continue to grow vigorously in a potentially huge market.

With a technologically superior relational database management system as well as forward-looking Internet products, Oracle Corp. will lead the industry next year, according to Rob Tholemeier, an analyst at Meta Group, Inc. in San Francisco, and Rich Finkelstein, president of Performance Computing, Inc. in Chicago.

Sybase, Inc.'s recently announced System 11 will remedy past shortcomings and provide some helpful features, but it may not go so far as to restore the technology edge the company once held, Tholemeier says. It won't be for a lack of trying, however. In 1996, Sybase plans to release a new version of PowerBuilder and products to business-enable the Web as well as object-oriented tools, middleware and servers. Informix Corp., a solid company with a solid product, will add support for massively parallel and loosely coupled symmetrical multiprocessing machines by June. It will do well if it doesn't go off in too many directions at once. Oracle may have the resources to pull off such diversification, but Informix doesn't, Tholemeier says.

Computer Associates International, Inc. will announce a more scalable implementation of CA-Ingres by Feb. 1, followed by a business-oriented object DBMS, to be announced by July 1.

Microsoft Corp. has begun benchmarking its SQL Server, and this challenger to entrenched Unix RDBMSs will achieve some significant wins in 1996, the analysts predict. The main obstacles to its success are its Windows NT-only nature and whether it will scale beyond four processors. — *Dan Rickman*

## Client/server applications

With its nearest competitors trailing it by more than $1 billion a year in revenue, German software phenomenon SAP AG, maker of the R/3 system, will remain the dominant player in the market for enterprise client/server applications. Advanced Manufacturing Research, Inc. in Boston estimates the market for these applications will reach $5 billion in 1996.

Among the companies to watch in the coming year are $113 million PeopleSoft, Inc. and $122 million Baan Co., analysts say. PeopleSoft has a growing suite of workflow-enabled applications, and Baan, a Dutch firm, has established a suite of integrated manufacturing and financial applications that a growing number of users consider a less expensive, lower maintenance alternative to R/3.

Another move could cut client/server implementation costs and shorten project completion times — two ongoing user concerns. Large and small vendors will continue to team with even smaller niche software providers as the trend toward capturing vertical markets with preintegrated, industry-specific, best-of-breed software takes shape.

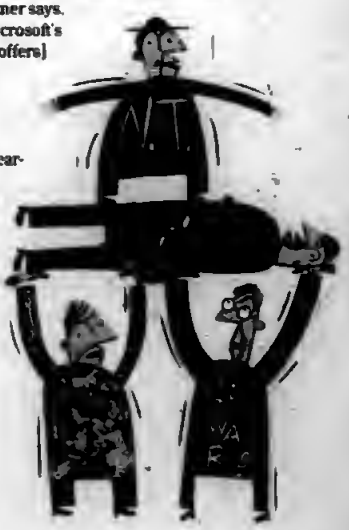
SAP and Oracle Corp., in particular, will continue to fill their dance cards with makers of supply chain management, logistics and scheduling software. Windows NT versions of client/server applications also will hit the market in a big way throughout the new year. Midsize companies attracted by the lower price points of the Intel Corp. platforms on which NT runs will compose the largest user group to deploy NT-based client/server applications. By year's end, however, this group will begin to include larger companies that are looking to consolidate applications under a single, easy-to-administer operating environment. — *Julia King*

## Desktop operating systems

The year isn't expected to bring a lot of surprises in the desktop operating system arena. Microsoft Corp.'s megamarketing push for Windows 95 will die down to a dull roar, but Windows 95 still will gain in popularity and become the dominant desktop operating system.

Microsoft's Windows NT will continue its push away from the workgroup computing space to serve on a more departmental level. That might be good news for Microsoft and those who use NT for file and print sharing and application serving. But it is bad news for Novell, Inc.'s NetWare, which is losing market share to NT Server, according to Peter Kastner, an analyst at Aberdeen Group, Inc., a market research firm in Boston. "Users will have one box for all their server needs — one box to buy and one box to manage," Kastner says.

NT also will be bad news for Unix. "Microsoft's NT is aggressively challenging Unix. [It offers] the same performance at half the price," he adds. And while IBM isn't sounding the death knell for OS/2, NT just might be. IBM executives have long denied they will pull the plug on the 10-year-old operating system. They have instead repositioned OS/2 as a server operating system, but that pits it against NT and could be the final blow for OS/2.



Apple Computer, Inc.'s possible failure this year to ship Copland, the next generation of its Macintosh operating system, could be a major blow to the Cupertino, Calif., firm. Apple already has its hands full with financial problems, questions about its future and a chronic inability to meet product demand. Delivering Copland late will magnify those issues.

— *Lisa Picarille*

## Telecom

Deregulation . . . convergence . . . trivestiture . . . hold the phone!

It looks like 1996 will be a year of major upheaval in the telecommunications industry.

To start with, the industry's 800-pound gorilla, AT&T Corp., is evolving into three independent primates — a long-distance carrier, an equipment company and a computer maker. The rationale is that after trivestiture, each new species will be better adapted to plucking bananas off the high branches.

The telecommunications arm of AT&T will enter the wildest fray of all in 1996 — the chaotic jockeying for position as the walls that separate long distance from local service come crashing down.

Look for Baby Bells to begin making alliances to place themselves in the long-distance business.

And watch as AT&T, Sprint Corp. and MCI Telecommunications Corp. attempt to move into local markets. Throw in the cable companies and the wireless wild card, and it makes for a volatile brew.

A wave of new products is expected to move the long-touted convergence of computers and telephone systems forward.

AT&T will lead the way with a new server that links the local data network with the private branch exchange telephone system.

In the area of high-speed service offerings in 1996, frame relay will continue to be the market leader for corporations that need to send large amounts of data to multiple sites.

The availability and use of Integrated Services Digital Network for Internet access and telecommuting will continue its strong growth. — *Neal Weinberg*

## Remote access

One of the looming questions the remote access industry faces as the new year begins is "What happened to the wireless revolution?" Will 1996 be the Year of Wireless?

The answer, by most accounts, is that 1996 won't be the year when wireless networks and applications take off and flood the marketplace with untethered road warriors. But prognosticators also say real advances will come this year and, at the very least, wireless technologies should gain some steam.

In the coming year, remote users should look for increasingly sophisticated PC cards that provide better connectivity. These PC cards will give notebooks combined functions such as paging and Integrated Services Digital Network access. New devices, such as personal digital assistants with better connectivity features, will also drive the market, observers say.

Carriers such as Bell Atlantic Nynex Mobile, Ameritech Corp. Cellular Services, GTE Corp. Mobilenet and AT&T Corp.'s Wireless Division will continue to deploy Cellular Digital Packet Data (CDPD) networks.

But rival packet radio network providers such as ARDIS Co. and RAM Mobile Data USA L.P. are working furiously to reach agreements that will make their networks interoperable with such technologies as circuit-switched cellular and CDPD. Such agreements are necessary to bring in more customers, industry observers say.

The lack of a killer application, however, will continue to plague the wireless industry. Will it be wireless electronic mail? Access to the Internet? Messaging? Two-way paging?

Stay tuned.

— *Mindy Blodgett*

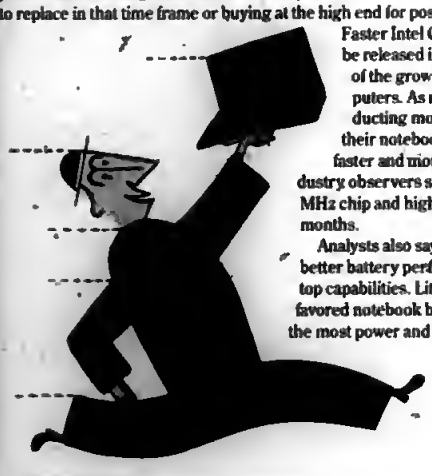
## Portable computers

Portable computers are getting faster, fighter and feature-rich.

And all signs point to skyrocketing demand and explosive growth for the laptop sector in the coming year.

Toshiba America Information Systems, Inc. and fellow first-tier vendors Apple Computer, Inc., IBM PC Co. and Compaq Computer Corp. will continue to dominate the market. But smaller companies, such as Texas Instruments, Inc., could eat away at the giants' market share, analysts say.

Industry observers note that the increasingly crowded market has spawned true desktop replacements. Competition among the top makers will ultimately translate into cheaper notebooks with more functionality, such as multimedia. Because the useful life of most notebooks is only about two years — due to constantly dropping component prices and technological advances — analysts recommend buying low-end computers to replace in that time frame or buying at the high end for possibly longer use.



Faster Intel Corp. Pentium chips will be released in 1996, following the lead of the growing power in desktop computers. As mobile workers are conducting more of their business on their notebooks, they are demanding faster and more powerful portables, industry observers say. Analysts expect a 133-MHz chip and higher in the next few months.

Analysts also say integrated chip sets and better battery performance will increase laptop capabilities. Lithium ion batteries are the favored notebook battery because they have the most power and longest working life.

*— Mindy Blodgett*

## PC servers

Intel Corp.'s November launch of its sixth-generation Pentium Pro chip is expected to define a lot of activity in the server space in 1996.

All of the major PC server vendors and some traditional midrange vendors will start offering highly scalable symmetrical multiprocessing (SMP) and massively parallel processing (MPP) Pentium Pro servers based on Windows NT.

The servers are expected to rival near-minicomputer performance by late 1996.

Users and industry leaders can expect to see some major improvements in network and systems management software, particularly in the areas of remote diagnostics and asset management from the Big Three server vendors: Compaq Computer Corp., IBM and Hewlett-Packard Co.

There also will be more emphasis on increased fault tolerance through standby servers and clustered-server implementations.

Most SMP offerings in the early part of 1996 will be predominantly quad-processor Pentium Pro servers which are based primarily on Intel's motherboards and reference designs.

Pentium Pro servers that scale beyond four processors will be available by midyear, but user interest in these servers is expected to be limited because of the lack of operating system and application software support in these environments.

The same factors are expected to have an impact on most SMP and MPP implementations through 1996.

Although a large number of PC vendors are expected to announce Pentium Pro servers and SMP systems, analysts predict that the market is likely to polarize around the big-name vendors.

In terms of absolute volume, Pentium will dominate the server landscape.

*— Jaikumar Vijayan*

## Mainframes

The mainframe still won't be dead in 1996. A third straight year of gangbusters growth is forecast. But a convergence of technical trends should start answering the question of whether IBM's System/390 will continue to enjoy a fruitful life.

Big iron continues to become not so big as customers shift to cheaper air-cooled machines based on CMOS microprocessors. IBM's 9672 family is expected to outship its water-cooled ancestors in the fourth quarter of 1996, and analysts estimate air-cooled boxes will account for more than 70% of the System/390 MIPS installed next year. Air-cooled hardware still can't match the liquid chillers on raw power, but it should be able to handle most processing jobs by the middle of the year, analysts say.

Competition also should enter the air-cooled picture then. IBM's third generation of CMOS processors, expected to run at 40 to 45 MIPS, will be matched and possibly exceeded by first-time products from Amdahl Corp. and Hitachi Data Systems Corp. "That's going to do wonderful things to the price range," says John Young, director of enterprise systems planning at The Clipper Group, Inc., a consultancy in Wellesley, Mass.

Several other attempts to make mainframes less menacing and better able to withstand competition from Unix and other open systems will also come to a head this year.

IBM's OS/390 operating system, which combines MVS with several dozen supporting products that previously had to be bought and installed separately, ships in March and will be updated within six months of that. A new version of IBM's DB2 database was released in late November, so its "parallel sysplex" clustering technology is ready to face the customer jury. This also should be a pivotal year in IBM's campaign to get Unix software vendors to hug mainframes. *— Craig Stedman*

## High-speed internetworking

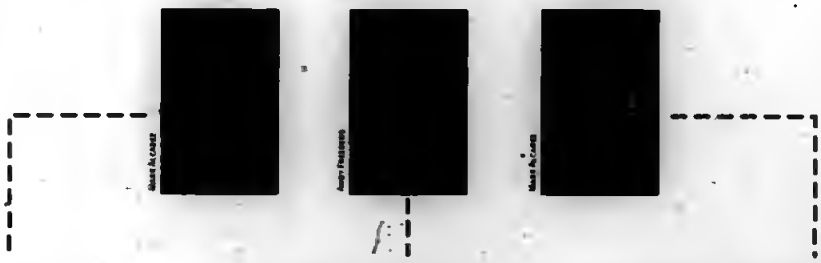
The big will get bigger and the small will become fewer as the superpowers scramble to extend their product lines from high-end, all-in-one switching hubs and backbone routers to remote access gear and adapter cards.

Vendors' Asynchronous Transfer Mode (ATM) marketing blitz will continue in 1996, but users will focus on increasingly available and lower-cost technologies such as Ethernet and Token Ring switching to build the front end of emerging switched internetworks. Switched internetworks give users dedicated bandwidth as opposed to the shared capacity on Ethernet lines and Token Ring LANs. For the backbone part, users will continue to use Fiber Distributed Data Interface and will begin to use ATM and 100M bit/sec. Ethernet as prices start to drop. Also, the internetworking superpowers — Cisco Systems, Inc., 3Com Corp., Bay Networks, Inc. and Cabletron Systems, Inc. — will be the telephone companies' best friends, and vice versa. The two will look to exploit each other's strengths by combining wide-area network links and networking gear in packages for end users.

Acquisition-happy vendors such as 3Com and Cisco will struggle to reconcile sometimes overlapping product lines and to support and enhance them in a coherent manner. So it may be quite a while before users have a single point of contact for service and support for 3Com's or Cisco's product lines.

At 155M bit/sec., ATM will be used by large users with super high-end data and video applications. Most users still can't justify the cost or the huge bandwidth. But vendors will have some success selling ATM on the desktop using 25M bit/sec. PC adapter cards. *— Bob Wallace*

# 'net stops



## Places your mom wouldn't let you go...

*By Kim S. Nash*

I've always wanted an ant farm. No, really.

But my mom, after she finished her "Ugh, that's awful" face, relegated the notion to the infamous "We'll see" category. Which meant, of course, that never would a colony of trisectioned insects cross the threshold of our Carmel, N.Y., home.

Steve's Ant Farm, at **http://sec.dgsys.com/antfarm.html**, has changed all that. Like the opening page at the site says, I watch live ants dig tunnels and move mountains. I don't have a high-resolution monitor, so the JPEG images aren't that great. But at least I've fulfilled a childhood dream.

(I feel compelled to point out that Steve's Ant Farm was designed by Washington-based Creative Services — the same company that helped create the NASA World Wide Web site. But I'm sure our tax dollars weren't at work on both projects.)

When I'm not burning up company time marveling at ant antics, I do put the Web to good use.

First thing every morning, after popping the top of a Diet Coke, I get my news. Lately, my favorite current events sites are *The New York Times* Syndicate at **http://nytsyn.com/live/News3/** and Reuters at **http://www.yahoo.com/headlines/current/business/**. Neither one wastes my time with gee-gosh graphics, and both let me drill down quickly to find the business and technology news I want.

I'm a National Public Radio fanatic, so I frequently tune in to **http://www.npr.org**. I love to pick up transcripts of various stories NPR broadcasts over ye olde radio — stuff I miss because my daily commute down the 101 in California is a quick 20 minutes. I also listen to the "Audio Story of the Day" via Progressive Networks' RealAudio. Bob Edwards right at my desktop!

Women Leaders Online is a must. The site was created to spur the Internet community to prevent the election of conservative politicians, particularly those who would be president. At **http://worcester.lm.com/women/women.html**, I monitor the rock-ribbed Republican policies (read: travesties of justice) from Newt, smiley Bob Dole and the rest of the old boys.

After I make my "Ugh, that's awful" face, they get an electronic earful from me, let me tell you.

*Nash is a* Computerworld *senior editor for the Internet.*

## Just call me a Gamin' Wretch

*By Mitch Wagner*

On-line research often is the only choice for collecting little bits of information fast and accurately.

What was IBM's gross revenue in each of the years from 1991 to 1994? Does Compaq still make a ProLiant model using Intel's 75-MHz 1486 chip? And where the heck is Great Plains Software located anyway? It's these sorts of things that add breadth, depth and authority to news stories ... and they're a huge pain in the patoot to gather, especially on deadline. And reporters are *always* on some deadline or another; it's the major reason we're such a grumpy lot.

Companies' sites on the World Wide Web are among the best sources for background information about the companies or their products. This is especially true of technology firms, where I can find out about products and revenue fast. To find companies' Web sites, I use some of the standard Web indexes: Yahoo (**http://www.yahoo.com**), WebCrawler (**http://webcrawler.com/**) and Lycos (**http://www.lycos.com**).

I spend my time writing about how companies use computers for business, and new companies come to my attention every day. Hoover's Company Database on CompuServe (**GO CIS:HOOVER**) gives me the basics, including the line of business a company is in and its revenue. For information about computer companies and computer products, I go to CompuServe's Computer Buyers' Guide (**GO CIS:COMPDIR**).

For on-line fun, I turn to the Science Fiction RoundTable on GENIE, General Electric's little-known on-line offering. There, I can hang out with thousands of writers, editors and fellow fans and join discussions about everything from nanotechnology to Roman history to horses.

For fun on the Internet, there are all types of weird sites that pop up occasionally.

You can play with a Lite Brite, look at fish in a fish tank or talk to some guy's cat through an electronic voice synthesizer. Recently, I discovered the anagram-generating site on the Web and learned that the letters of my name can be scrambled to form "Gamin Wretch" or "German Witch." What did we do before we had the net to give us such valuable information?

*Wagner is a* Computerworld *senior editor for the Internet.*

## From pork bellies to Spam

*By Tim Ouellette*

There is no simple welcome mat to the Internet with signposts clearly marking the attractions along the way. Even with directories such as the ever-popular Yahoo, it can take some heavy-duty surfing to find diamonds in the rough.

I stumbled onto some of my favorite spots completely by accident, often forgetting to place a bookmark to find my way back again. But now there are a few that I regularly visit with just the click of a button.

Of course my first destination is always the business side of things, as any surfer using a company's browser knows. ;)

Providing pure information instead of the glitz of the World Wide Web, I follow the **misc.invest.stocks** Usenet discussion group. With technology stocks performing so well this year, a large portion of the discussion centers around the expectations of several of our favorite industry leaders, company health reports, prospective deals and general investment suggestions.

The second stop on my daily trip is to check out an on-line newspaper, complete with pictures and graphics. *The Nando Times* (**http://www2.nando.net/nt/nando.cgi**) is one of the best, especially because it updates news information throughout the day. The site doesn't simply display a copy of that day's issue.

This is important because if I go to a site and find the same stale information more than a few times, I'll stop going.

Another reference point, Mark Wheeler's U.S. Soccer page (**http://www.cs.cmu.edu/~mdwheel/us-soccer/**), receives honorable mention in my book for its vast accumulation of anything and everything related to playing, following or watching U.S. soccer.

For sheer fun, though, I visit the Spam Haiku Archive (**http://www.asb.edu/~jchu/spam/archive.html**). Brought to my attention by a fellow worker, this site shines through as an example of the complete quirkiness accessible on the Web. Mixing the ancient Japanese poetry form of Haiku with the modern day creation (some say abomination) of Spam has spawned thousands of strange and unbelievable poems.

*Ouellette is* Computerworld*'s senior writer for groupware and E-mail.*

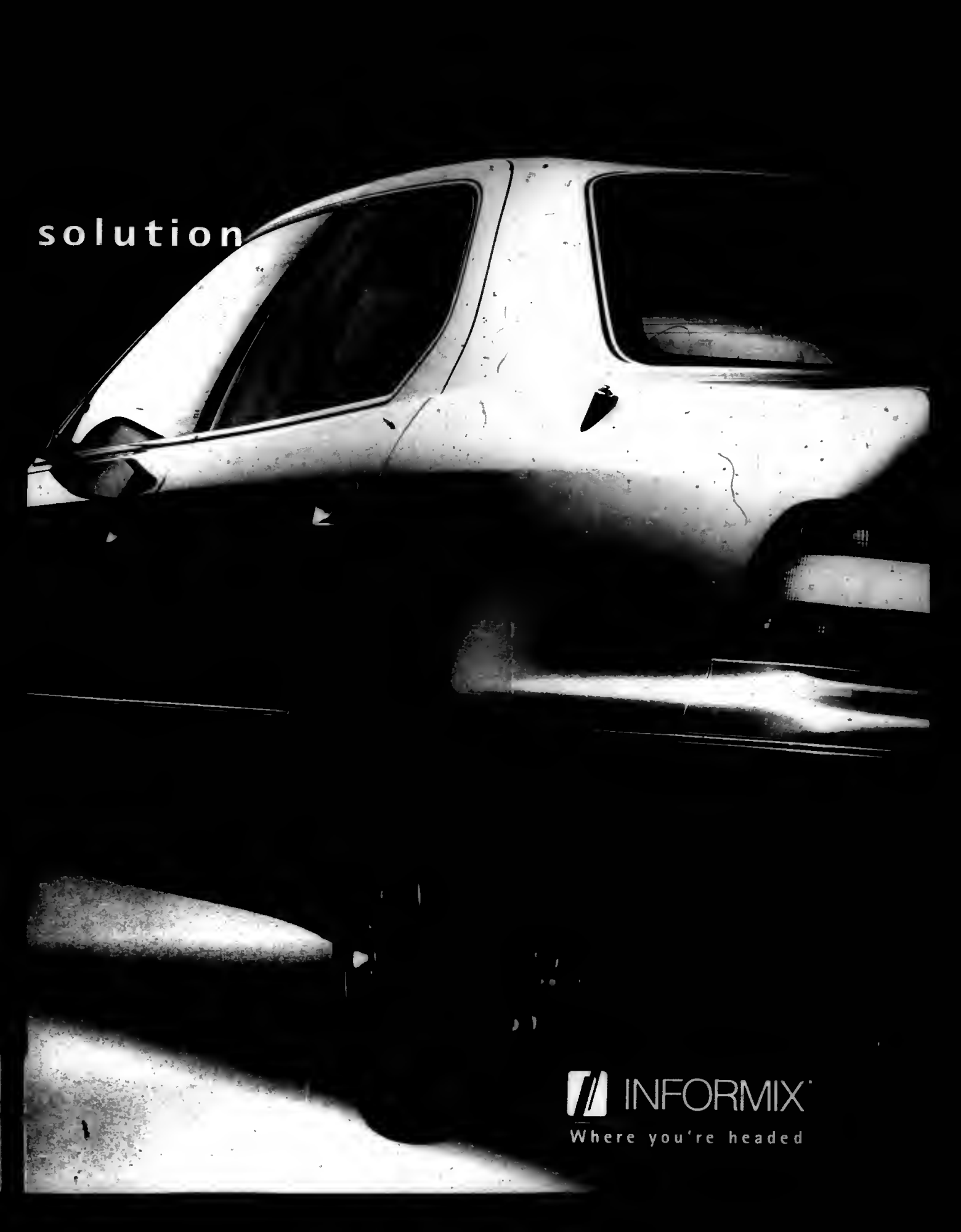
# Did your database vendor just pull a data warehousing out of the trunk?

*Informix DSA is the best all-round parallel DBMS on the market."*

*It is not clear what is actually going on. Oracle's marketing department is claiming capabilities, and talking about futures."*

*"Informix is well-placed to become the brand leader at the top end of merchant DBMSs."*

—Bloor Research, Parallel Database Report, 10/95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INFORMIX
Where you're headed

# Great minds think alike

*Information systems and business managers agree a whole lot more than you might think*

## What's this?

IS and business managers singing the same tunes?

We tried – oh, how we tried! – to find discordant voices in our survey of 551 IS managers, IS staff members and business managers. We asked the three groups – who are often believed to be at war with one another – for their opinions on the same issues. We looked hard for disagreement but found mostly harmony.

What's clear from our survey is that the philosophies of IS and business in regard to technology and the role of IS are very close – and much closer than we expected. The following charts show just how similar their credos are. – *Kevin Burden*

## Overall IS performance

Percent who agree or strongly agree

### Shaky ground?

Figures show IS personnel are slightly less confident than business managers when rating their effectiveness compared with the competition

"Our company uses information systems more effectively than our competitors do."

### Ouch!

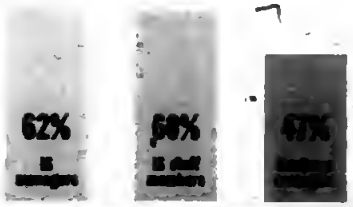
All three groups agree that their IS support structure could be better

"Our IS organization is well-structured to meet the needs of end-users."

### Double ouch!

Business managers don't think IS relationships are so great; IS disagrees

"Our IS organization has a good relationship with senior-level business management."



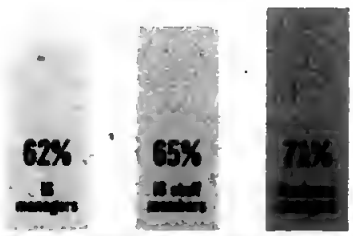

## IS/End-user relations

Percent who agree or strongly agree

### Long live the end user!

Although like-minded, business managers would give end users more power in driving IS

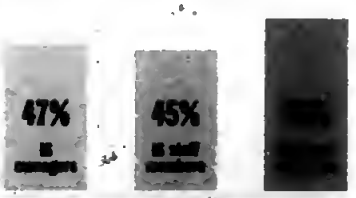
"End users should be the driving force in determining our IS direction."




### If you could walk in my shoes . . .

Business managers support the belief that IS isn't always treated fairly

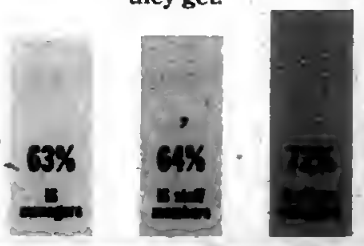
"Our company treats its IS employees fairly."




### No sympathy here

Most in the IS field have accepted that updated skills are necessary for survival. It's even more clear to business managers.

"Cobol programmers unwilling to update their skills deserve what they get."




## The value of information services

Percent who agree or strongly agree

### Whoa!

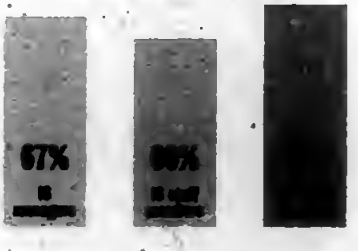
Putting the cart before the horse is a bad idea all around

"IS technologies should be the driving force in designing our business processes."

### It takes two to tango

All groups agree they need to work together for initiatives to be successful

"Information systems don't benefit the business unless accompanied by business practice changes."




### Some things don't change

All groups say technical proficiency is a necessary skill

"These days, if you're going to really make it in IS, it's better to have a business degree than a computer science degree."

# AGENTS OF change

Using finely tuned scientific methods (as in, we brainstormed), *Computerworld* chose nine companies on the edge of doing something big. In many cases, these companies were just smart enough or quick enough to take the newest technological advances and run with them. In some cases, it's the very *landscape* of their industry they're changing. Read on to see how they'll affect *your* landscape.

## Technology service firm poised to shake up hotel reservations systems

THE HOTEL INDUSTRY Switch Co. (Thisco) in Dallas is a technology service consortium that aims to save its 20 hotel company owners hundreds of millions of dollars in transaction fees each year. Thisco expects to accomplish this by letting travelers bypass airline reservations systems and book their own hotels over the World Wide Web.

Thisco executives say they expect to process about 200 reservations per day in 1996 through the consortium's TravelWeb page, which already contains "electronic brochures" from 24,000 hotels. The brochures include detailed descriptions and photographs of rooms. TravelWeb's Find A Hotel service lets PC users search for a hotel by geographic location, property name, room rate and/or various amenities, such as health club facilities or babysitting services.

"You couldn't do this before because hotels were limited to using proprietary networks," such as Galileo International's Galileo, American Airlines' Sabre and other airline computer reservations systems, says John Davis, president and CEO of Pegasus Systems, Inc. Dallas-based Pegasus is Thisco's parent firm.

"The World Wide Web has been a breakthrough," Davis says.

Thisco's owners include Best Western International, Hyatt Hotels Corp. and Hilton Hotels Corp. The service essentially acts as a "giant protocol converter" on the Internet, Davis explains.

Thisco's Ultraswitch proprietary computer system converts users' incoming messages from the Web's Hypertext Markup Language into a format that a hotel's reservations system can read. It then forwards the request to the hotel system.

If, for example, a user was querying a Hyatt hotel, Hyatt's system would transmit a listing of available rooms and give the customer a choice of three. If the customer opted to make a reservation, Thisco would route the booking directly to Hyatt's reservations system, which would then return an electronic confirmation to the customer.

The service is free to customers. Thisco charges the hotels a fee that is about half the $3.50 per transaction charged by the airlines. TravelWeb also lets hotels use their reservations databases to better market their facilities, Davis says. For example, it lets hotels describe the difference between a $140 room and a $100 room.

Davis predicts it will be two to three years before TravelWeb — and the inevitable competing services — becomes the dominant method travelers use to make hotel reservations.

In the meantime, Thisco is developing similar Internet-based reservations systems for rental car companies, restaurants and some 14,000 golf courses nationwide. — *Julia King*

Paul Francis

Thisco CEO **John Davis** says the company's new service aims to save its hotel company owners hundreds of millions of dollars by letting travelers book their own hotel reservations via the Web

## Hyperlinks, wizards and bots, oh my!

DUTCH PAINTER Jan Vermeer is known for his lush, vivid paintings of 17th-century life in Holland.

Today, Vermeer Technologies, Inc., a start-up software firm in Cambridge, Mass., wants to make a name for itself as an enabler of similarly lasting creations for the World Wide Web. And this being the 20th century, Vermeer (the company) also wants to make a buck.

Vermeer Technologies co-founders Randy Forgaard (left) and Charles Ferguson say their Web development kit is easy enough for novices

Judging by the meaty contracts Vermeer has signed with firms such as Fidelity Investments, Inc., Merrill Lynch & Co. and Tribune Media Services, the little company is on to something.

Instead of brushes and oils, the 17-month-old company uses hyperlinks, wizards and bots.

Vermeer's FrontPage development kit was designed to let users — even Web novices — drag, drop, point and click to create graphical applications that run on the Internet.

Hyperlinks are links to other Web pages. Bots are mini programs prescripted for routine tasks, such as linking database columns to sections of Web pages.

Wizards help developers design those pages. For example, FrontPage includes wizards for building a table of contents, laying out page borders and devising registration forms.

"It's like they're trying to remove as much work as possible" from Web programming, says Jay Brodsky, a technology coordinator at Chicago's Tribune Media Services.

Vermeer has signed on six vendors to resell FrontPage, including AT&T Corp. and FTP Software, Inc. in North Andover, Mass. Vermeer wants to line up as many resellers, bundlers and other partners as it can to peddle its products, says Charles Ferguson, Vermeer's chairman and co-founder.

Nearly everyone in the tools and database market is bound to ship Web development utilities in 1996, but Vermeer has beaten many of the big guys to market. Therein lies "a huge advantage," says Geoffrey Bock, an analyst at Patricia Seybold Group in Boston.

Also key is Vermeer's "come one, come all" philosophy, Bock says.

Unlike would-be competing tools from Netscape Communications Corp. or Oracle Corp., FrontPage supports several Web servers and the Top 3 relational databases.

"We don't want to turn people away just because they don't happen to use this or that server or the most popular database," Ferguson says.

*— Kim S. Nash*

## A peacemaker for battling network tools

HANG ON! Help is on the way for network managers who have so many proprietary management tools monitoring diverse components that they don't know which way to look.

Soon a 2-year-old project by a Palo Alto, Calif., developer will help these managers see the forest as well as the trees.

Start-up firm Network Intelligence, Inc. plans this spring to launch software that gathers data from installed tools and its own distributed agents, then summarizes network behavior and delivers daily reports that point out problems affecting processes. The product acts as a filter, so support staff can drill down with their specific tools to find and fix problems.

Network Intelligence President Brian Szabo is selling accountability at the desktop

One company testing Network Intelligence's upcoming Contour Network Management System discovered a slowdown affecting some users and then found an erratic router that had been overlooked for months.

Several vendors are similarly shifting management — from fault reaction to an understanding of performance — and many in 1996 will deliver tools that coordinate data from diverse and sometimes proprietary devices.

But Network Intelligence is preparing the most comprehensive view so far, according to Clare Garry, a senior research analyst at Gartner Group, Inc. in Stamford, Conn.

"Contour lets network managers see data gathered by multiple vendors in the same way," Garry says. "The interface hides the complexity of proprietary tools, and the database correlates all the separate reports. This approach makes managers more productive."

Network managers used to just maintain the infrastructure. Now they must respond to users who ask about performance changes or the impact of applications, says Brian Szabo, president of Network Intelligence.

*— Patrick Dryden*

## Taming the labor beast: Campbell optimizes workforce schedules

CAMPBELL SOFTWARE, Inc. is offering users in the retail and service-oriented space an innovative way to reduce costs and increase profits by controlling their biggest expense — their workforce.

The Evanston, Ill.-based company offers users a family of customizable products for in-store and enterprisewide employee management. Campbell's Workforce Management Suite, which runs on 16 platforms, comprises products that perform time and attendance tracking, forecasting and budgeting, staff planning and optimal labor scheduling.

Some high-profile retail organizations such as The Gap, Inc., Crate and Barrel, Walgreen Co. and Walmart Stores, Inc., have already jumped on board with the software. And half a dozen high-profile technologists have invested in the company — Dan Bricklin, the inventor of spreadsheet granddaddy VisiCalc; Jeffrey Tarter, outspoken industry pundit and editor of "Softletter"; and Andrew Filipowski, president and CEO of Platinum Technology, Inc., to name a few.

Campbell Software President Mike Campbell has big-name clients and backers on his team

Thomas Friedman, editor and publisher of "Retail Systems Alert," a Newton, Mass., newsletter that focuses on retail automation, says Campbell Software is remarkable in two aspects.

First, its products are based on an optimization engine that has been adapted for the labor-intensive retail business. Campbell works with its clients in stores, at regional offices and at headquarters to develop algorithms that determine the best staffing schedule. That schedule is based on each store's requirements, including union rules, preference for scheduling, employee skill levels, payroll requirements and performance standards.

Second, Campbell has an inside track on customer needs because it struck a deal with Anderson Consulting, a firm many retailers turn to for help setting up labor rules, Friedman says.

Workforce management is retailers' single largest expense, and it's the fastest-growing segment of the $5 billion to $10 billion retail automation business. Friedman estimates the labor scheduling market at more than $2 billion.

*— Lisa Picarille*

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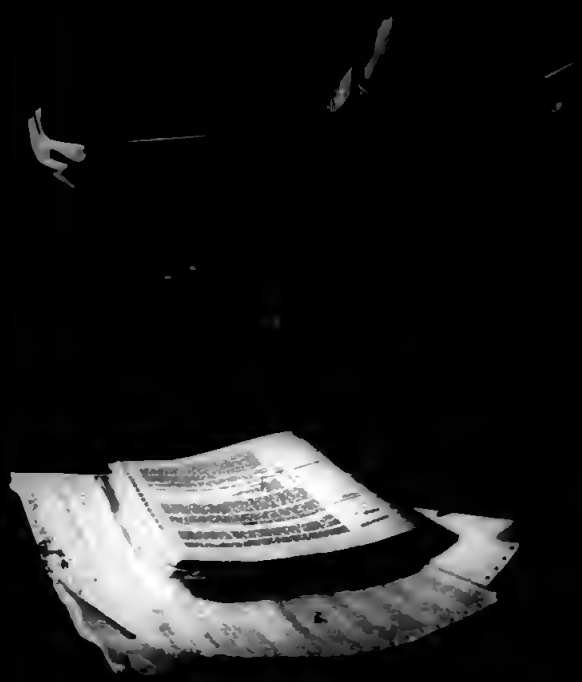

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# AGENTS OF change

## Planning for golden years goes on-line: Broker offers investment advice on Web

PRUDENTIAL SECURITIES, Inc. doesn't have a magic investment strategy that gives you a fast route to retirement.

But the New York securities firm will soon introduce an Internet-based service that will allow customers to plan for their golden years more effectively.

In January, Prudential will roll out a World Wide Web site — www.prusec.com — where customers will be able to plug their personal financial data into an on-line calculator and get help with planning for such events as retirement or a college education. The cybercalculator, developed in-house at Prudential, is just one of several on-line features that should help differentiate the brokerage from its rivals — at least in the short term.

Prudential expects to become the first full-service brokerage to offer customers full on-line access to their accounts, including an electronic path to daily cash balances and the total net worth of their portfolios, says Stanley F. Witkowski, director of strategic client initiatives at Prudential.

Other Web sites, such as those by Fidelity Investments and Charles Schwab & Co., allow customers to order literature and download prospectuses. But unlike Prudential's, those sites don't yet offer on-line investment counseling.

Stanley Witkowski heads up strategic client initiatives at Prudential Securities, aimed to take an early lead in on-line access to financial accounts

Prudential's "value-added" comes from the electronic connectivity between the firm's financial advisers and clients, Witkowski says. Beginning in January, customers will be able to electronically access financial advice that will be posted for public viewing. In the next phase, later in 1996, Prudential's financial advisers will send out electronic messages with advice for clients, he says.

Nevertheless, the brokerage's lead in electronic account access probably won't last too long, says Mark Hardie, a technology analyst at The Tower Group, a Wellesley, Mass.-based financial services and technology consultancy. "Within the next year, financial services technology leaders with Web sites will provide similar types of access," Hardie says. — *Thomas Hoffman*

## Here's a novel performance pitch: Better queries

PRECISE SOFTWARE SYSTEMS, Inc. has a revolutionary idea for making client/server database applications work better: Fix what's broken, not just what's easy to fix.

In January, Precise will roll out a client/server version of Precise/SQL, a suite of software tools for tuning the performance of database applications.

Most tool sets of this kind were designed to tune the database. Precise's approach is a bit different; its tools help programmers write better queries without forcing them to be database gurus, says Dan Haley, president and CEO of the 5-year-old Braintree, Mass.-based company.

### Quicker replies

This translates into better performance, users say. "In some cases, we went from two- to three-hour queries and some that never came back to [getting a response, on average, in] 15 minutes or less," says Pete Roberts, an information engineering specialist at Motorola, Inc.'s Semiconductor Products Sector in Tempe, Ariz.

Roberts has been using a beta version of the client/server tool to tighten up stored queries in Motorola Semiconductor's Oracle Corp.-based data warehouse. Taking what is ordinarily a time-consuming process of individually examining and rewriting stored queries, the Precise tool set reads in an entire set of queries, then uses an expert system to suggest improvements. Roberts estimates that this tool will be able to cut the amount of work by 80%.

Precise Software Systems CEO Dan Haley: 'Tune query, not database'

"[Precise] plugs a gaping hole in the marketplace," says Michael Abbey, an Ottawa-based database consultant. "People spend inordinate time and money tuning the database because there are tried and tested ways of doing that." But Abbey says he's seen no other vendor with such a workable approach to tuning queries.

"And it's cheap," according to Abbey, who estimates that the $30,000 client/server version, which works with Oracle databases, should pay for itself in a single four-month project by cutting the time needed to do performance tuning.

— *Frank Hayes*

## Expense reports don't have to be such a chore

"FIND A NEED and fill it." "Focus on the customer." "Stick to your knitting." These aren't just cliches to Portable Software Corp.

The 2-year-old Bellevue, Wash.-based company lives by those platitudes, and its QuickXpense product, a flexible expense reporting package, embodies those values, says Michael Hilton, president and CEO.

Indeed, QuickXpense lets users tally expenses based on their company's accounting categories, and Portable Software will also make up electronic versions of expense report forms for any company that sends in a paper form. And more than 2,000 companies to date, including almost all of the Fortune 1,000, have done just that, Hilton says.

"They pay very, very close attention to what their customers want and do exactly that," says Chris Le Tocq, principal analyst at SoftTracks Software Research, a market research firm in Los Altos, Calif.

QuickXpense "lets you put in your own account categories," says Jon Bosaw, director of sales and marketing at Lynnwood, Wash.-based Symetrix, Inc., a manufacturer of professional audio products for recording studios and live audio and broadcast applications. Bosaw, whose job takes him around the world, began using QuickXpense soon after it came out in late 1994.

"Using our paper forms, I had to look up account numbers and then manually total each category. This is a lot easier," he said.

The company, which Hilton started in 1993 with his own money and funds from private investors,

Expense reports, page 38

# Five Ways My Company Can Help Your Company Make Better Business Decisions

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Dr. James H. Goodnight
President, SAS Institute Inc.

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2

***Business Intelligence*** You've heard all the buzzwords (EIS, DSS, OLAP, Intelligent Query, Visualization). But what do they all mean? As a collection of incompatible products, they could mean trouble. But together and fully integrated into a comprehensive decision support environment, they could mean making good business sense out of reams of raw data. We provide them all. And we can design just the right mix for you.

3

***Technical and Analytical Tools*** Of course, decision making is not unique to the business side. If you have quality issues on the shop floor or need to analyze the results of your market research, we can deliver the industry's richest set of tools for handling virtually any analytical need.

4

***Applications Development*** If you need to build decision making into customized systems to get a jump on the competition, count on applications development tools ideally suited for decision support. Count on ours. Our iterative approach to rapid applications development can shave months off of your development cycles, and get the right information into the hands of your decision makers faster.

5

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# AGENTS OF change

Magdalena Yesil, a CyberCash vice president, says the company's system is approved for use by Visa, MasterCard and American Express

## Virtual credit-card swiper makes banks feel secure

AS INTERNET COMMERCE matures and more consumers turn to the World Wide Web to shop in the next year, look for CyberCash, Inc. to be among the leaders of the virtual credit-card swipe.

Securing credit-card payments over the Internet is the first piece of what the founders of Reston, Va.-based CyberCash hope to make into a digital cash, credit- and debit-card payment system serving banks and merchants internationally.

CyberCash, founded in 1994, is a more comfortable partner to banks and offers an easier system for regulators to audit than those of some rivals, says John Pescatore, research director for information security at International Data Group in Falls Church, Va.

A Netherlands-based firm called Digicash BV, for example, offers a system that ensures a buyer's anonymity as if the buyer were using greenbacks. "And like cash, no one knows where the money came from," Pescatore says.

"An approach like CyberCash would still keep financial institutions in the loop. That's much more palatable to governments and banks and their lobbyists," he says.

CyberCash gives Internet surfers and merchants a virtual gray box. CyberCash encrypts credit-card, purchase and merchant information and zips it over to a bank network. In several seconds, the bank returns an authorization code to CyberCash, and the merchant can approve the sale. CyberCash, which provides software to consumers and merchants, earns transaction fees from banks.

Magdalena Yesil, a vice president at CyberCash, says the company has links to approximately 80% of the U.S. banks authorizing credit-card payments, including Wells Fargo Bank and Mellon Bank Corp., and it is accepted by American Express Co. — *Michael Goldberg*

## Around the corner or around the world, it doesn't matter to Allied

ALLIEDSIGNAL AEROSPACE is looking to a 1996 re-engineering project to help make its aircraft parts repair and overhaul business soar.

The goal is to get the two dozen independent repair centers that make up the Global Repair and Overhaul Operation working and sharing resources as a single business unit. What makes this project ambitious is that the centers are scattered across the globe, so coordination must span national boundaries and language barriers.

"Right now, for instance, the customer in Japan goes to Singapore out of habit. But he might be better off going to England or Phoenix, where the work might be done faster or for less cost," says Paul Hoedeman, vice president and chief information officer at AlliedSignal in Phoenix.

The project puts the company at the forefront of globalization efforts, according to analyst Tom Willmott at Aberdeen Group, Inc. in Boston. "Until now, technology has been too expensive and too inflexible to permit this kind of process to take place," he says. In addition, he says, most companies haven't had the skills to contemplate such a massive shift.

The repair and overhaul business, with about 2,000 employees worldwide, is a key component of AlliedSignal Aerospace's overall business. With $4.6 billion in sales, the organization — a division of AlliedSignal, Inc. — is the largest aerospace equipment manufacturer in the world, making everything from jet engines to cockpit instruments to cabin-pressure systems. Customers include the U.S. military, The Boeing Co., McDonnell Douglas Corp. and Gulfstream Aerospace Corp.

AlliedSignal will re-engineer its business processes and make sweeping changes to the firm's information systems. The goals of both IS and the business units are to centralize management and resources, speed up production and improve long-range planning, says Don Caldwell, vice president of business systems for marketing, sales and service at AlliedSignal Aerospace.

AlliedSignal CIO Paul Hoedeman points out that far-flung units can be more cost-effective

The process will probably take two to three years, he says, although the efforts will be coordinated to roll out in several six-month phases. "We don't want our users to have to wait all that time to see results," he says. — *Mitch Wagner*

## Expense reports don't have to be such a chore

*Continued from page 35*

now has more than 40 employees. In September, it released a version of QuickXpense for Windows 95. The new version includes a feature called HotelXpert that automatically handles recurring entries such as room charges.

Last summer, Portable Software also inked a deal with GE Capital, issuer of the GE Capital Corporate MasterCard, to provide a link that automatically downloads charge account information into expense reports.

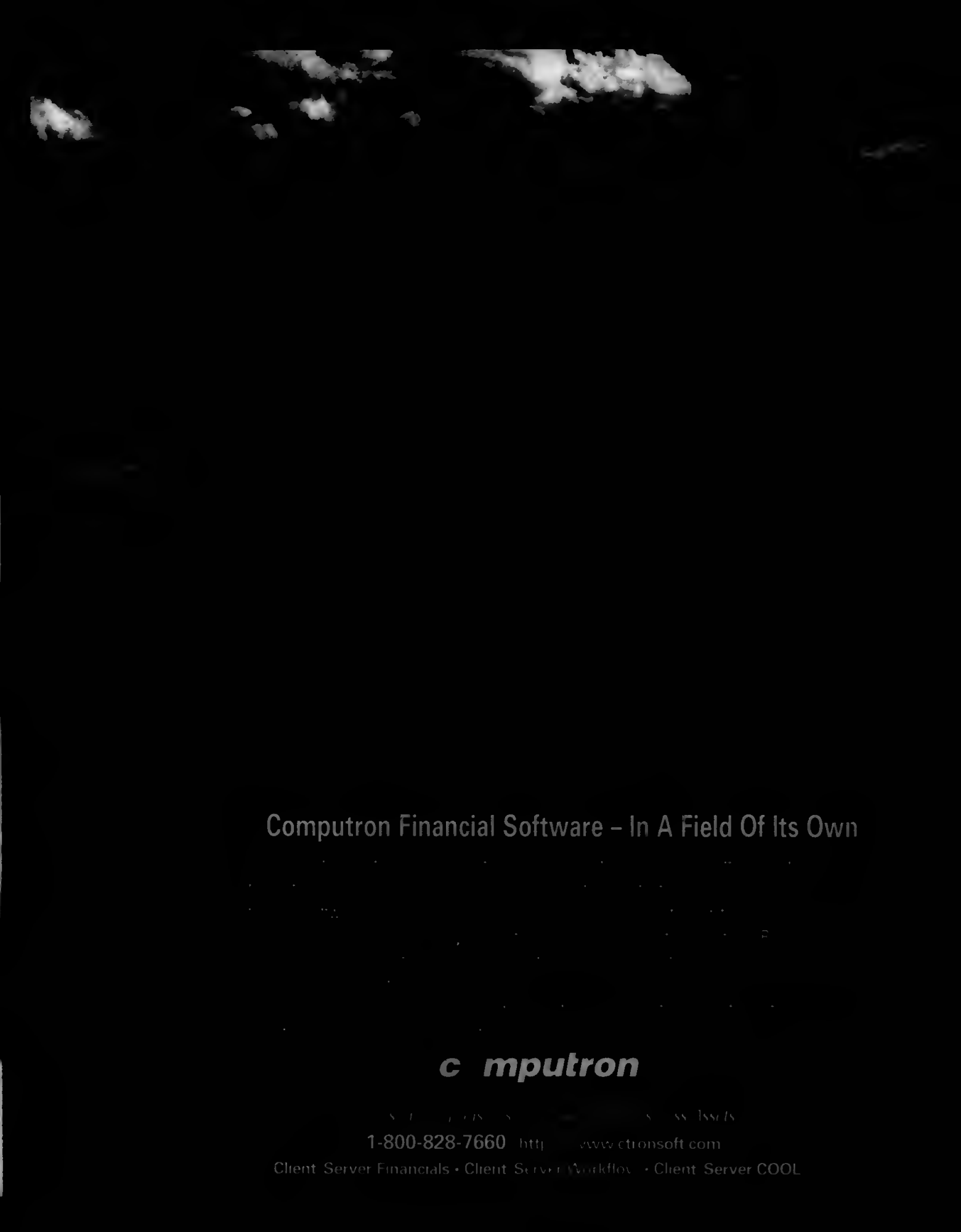
This link to credit-card data provides a first step into the nascent world of electronic commerce, according to Le Tocq.

The decision to add such capabilities didn't come out of thin air. Portable Software has instituted a corporate advisory board of about a dozen large customers to get feedback on what users want.

Next on tap: a set of products that will help automate the workflow process surrounding expense tracking. The organization is planning to release the first of those tools in March, Hilton says.

— *Stuart J. Johnston*

Portable Software CEO Michael Hilton: 'Match what users have'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# DUBiOUS DiSTINCTiONS

## Looking ahead

*By Paul Gillin*

**! Lotus** will quit the suite market and sell SmartSuite to a Cub Scout pack in Minneapolis. However, the scoutmaster will insist that the troop intends to enhance the product.

**! The FCC** will totally deregulate the telecommunications industry, ushering in a new era of competition in which every idiot with a spool of wire can — and will — become a carrier.

**! ISDN** finally will come into its own, probably sometime on July 17.

**! The Justice Department** will file an antitrust suit against Microsoft over The Microsoft Network. The suit will be dropped, however, with Microsoft agreeing to "try really hard not to be so competitive" and giving each Justice attorney 100 hours of free connect time.

**! An election night uproar** will occur when an unknown presidential candidate named Bim Chintoh carries Florida. However, further investigation will reveal that the election returns were hand-tabulated on a Newton.

**! IBM** finally will catch up with the 1994 demand for ThinkPad computers. Unfortunately, it is 1996.

**! Microsoft** will modify its branding program so that, in order to use the Windows logo, independent software vendors must contribute 40 sheep and a hectare of their best soil.

**! Panic** will grip the computer security world when a team of German hackers reveals that after applying 40 supercomputers working around the clock for two months, they have managed to decode a secure Netscape message saying, "This is a test."

**! A leading market research firm** will report that Microsoft has captured 115% of the office suite market.

**! AT&T** will declare that it intends to be super-aggressive in the network equipment market and will name as president of that division a guy from Atlantic City named Vinny.

**! A re-engineering project** at a well-known company will result in layoffs, staff tension, bitter political battles and the firing of a prominent CIO. Well, now you know at least *one* of these predictions will come true.

Computerworld Editor Gillin's flippant, fortuitous, fanciful and feckless predictions have become an irregular feature of the annual Forecast issue. As for the inimitable Maglitta (right), when he's not embroiled in some investigative reporting of a more serious nature, he is Computerworld's senior editor at large.

## Looking back

*By Joseph E. Maglitta*

**Just because you can, doesn't mean you should.** The year's most inane utterances, wretchedly needless products and services, ham-handed press releases, tasteless spectacles and sophomoric promotions:

**? OK fellas, we want to see both hands on the keyboard at all times**
From an "urgent fax" from the Rocktropolis World Wide Web site and *Detour Magazine*: "Newsflash! 'Showgirls' star to speak out on the internet (sic) . . . mass virtual phone sex??!!"

**? Does it work on outsourcers?**
Sedona Online in Sedona, Ariz., introduced a crystal amulet designed to ward off computer problems. The "Magical Vortex Energy Charged Crystal" has a no-refund guarantee.

**? We were afraid to search for diarrhea.com**
Among domains recently registered on the Web: metamucil.com, hemorrhoids.com, underarm.com and halitosis.com.

**? Big deal. Wang Labs has already been there, done that**
German computer company executive Horst Braun has been to heaven, hell and purgatory, according to the *Weekly World News*, the result of having died and been revived 47 times since 1965.

**? Bet it was a tiny showing**
A party invitation announcing the launch of Willows Software featured a crude drawing of a man with no pants, holding open his wrinkled raincoat. The tag line: "Expose the Windows API."

**? We're sure they appreciated the silence**
Microsoft packed European journalists into a submarine and submerged to emphasize what the world would be like without Windows 95.

**? Whadda'ya say we all forward it back to him on the count of three . . .**
For $425, Jeff "Spam King" Slaton will send thousands of the same message to Internet Usenet groups or electronic mailboxes. Most shill a client's product or interest.

**? They should have called it "L.A. Riot"**
Softdisk Publishing released a demo version of "In Pursuit of Greed." The secret to winning the $39.95 CD game? "If it's not nailed down, steal it. If it's moving around, shoot it."

PHOTOGRAPH BY MARK ANDREW

# 1 JUST one QUESTION

**Want a quick dose of wisdom from the likes of Bill Gates, Jim Clark and Gordon Bell? *Computerworld* posed a single query to 11 industry leaders.**

## Larry Ellison

**Ellison is almost certainly the only computer-industry figure to hold an honorary degree from Northern Jiao-Tung University in China. He founded Oracle Corp. in 1977 and has been its CEO ever since. Harvard Business School named him Entrepreneur of the Year in 1990.**

**Q:** In the long term, why is it better to control the database standard than to control the operating system standard?

**A:** Because it's called the Information Age, not the Operating System Age. The better an operating system gets, the more invisible it becomes — therefore, the easier it is to swap out for another one. The ideal operating system arrives across a network when you turn your computer on. Then it lets you easily navigate to the applications you use to operate on data stored in a database — not in the operating system file system. The software that you interact with and rely on every day are the applications and the underlying database — not the operating system.

## Andy Hertzfeld

**Hertzfeld is Software Wizard (yes, that's his official title) at General Magic, Inc. in Sunnyvale, Calif. He and Bill Atkinson were the original designers of the Macintosh interface.**

**Q:** What do you think will be the next major advance in user interface design?

**A:** The next big thing will be using physical metaphors to navigate. Users would leverage off the intuition and experience of real life, taking the physical metaphor to the network. I am not a fan of the social interface where cartoon characters interact with you.

The physical metaphor would be like a series of buildings and rooms that five to 10 years down the road would be rendered in 3-D. It would be an explorable world, like Myst, but not oriented to being a puzzle. Rather, it would provide the most clarity possible. It would make it easy to find things, not hide things.

I also see more interfaces that use the human senses, like speech. Speech recognition will really start coming into its own. But it should be seen as a way to augment things, not as a panacea or the only way to interact with a computer.

Vision also will be important. Maybe a computer can look at you and adjust the display based on how far away from the screen you are sitting.

Touch is another. Touching is forced feedback and allows you to manipulate yourself in a virtual world. Hand controls could change texture or their "give" based on feeling.

But speech will be the big one over the next couple of years because it's so practical.

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# JUST one QUESTION

## Jim Clark

A new billionaire (at least on paper), Clark is chairman of Netscape Communications Corp. In what are now perceived as the olden days of the computer industry — the early 1980s — Clark started Silicon Graphics, Inc.

**Q: Where does the chairman of what is probably *the* most widely recognized Internet company go when he's perusing cyberspace?**

**A:** Clark says his first choice for fun is http://cheiix.cl.msu.edu:80/weather. That's right: A World Wide Web site devoted to weather. The pages, run by Michigan State University, include national forecasts and local Lansing, Mich., weather. The movies and images showing recent hurricanes, tornadoes and other natural wonders are intriguing, he says.

Clark also loves stock quotation services and miscellaneous on-line news spots. In general, however, Clark says, "I got my original bookmarks from Marc Andreessen's home page. The list is too long" to enumerate.

Andreessen, of course, is the 24-year-old brains behind the Netscape Navigator browser that worked Wall Street investors into a foamy frenzy during Netscape's initial public offering last August.

Clark does have his own home page, at http://www.netscape.com/people/jim/index.html. Curious Web wanderers can check out a brief photo album of the millionaire and former Stanford University professor, including baby pictures and a snapshot of Clark bobbing about on an inflatable raft.

## Gordon Bell

Jana Haldane

As father of the VAX, mentor to high-tech creative minds, overseer of the Computer Museum in Boston and unflagging technology activist, Bell may live to become a legend in his own time. If it concerns technology, he is likely to have a strong opinion about it.

**Q: What jobs now performed by humans will computers replace first?**

**A:** The most vulnerable human activities are transactions where a few bits — standing for money, services or tokens — are exchanged. The most vulnerable are bill handling and financial and banking transactions of all kinds.

One of my favorites to go [away] is lawyers for simple transactions because they're so vulnerable and easy to replace, but then they have the power to make it illegal. The vast amount of papers they produce will soon be passe as computers take on transmitting, bonded archiving and displaying documents such as wills and contracts.

The publishing industry [typesetting, proofreading] has undergone much change, and the paper form of publication is generally vulnerable. Greeting cards are ripe for change as various forms of user-directed creativity for multimedia become available.

As the Internet and interactive TV become pervasive, more complex transactions requiring descriptions and expertise will become vulnerable as well.

## Esther Dyson

Dyson recently presided over the ninth annual East West High Tech Forum in Bled, Slovenia, the western-most part of the former Yugoslavia that borders Italy and Austria. Dyson is founder of this forum and founder of the industry newsletter "Release 1.0."

**Q: What can we learn from the emerging businesses in the former Soviet bloc? What are some challenges they face?**

**A:** In the U.S., we know how to do things [information systems-wise] pretty well and, therefore, are less willing to throw out existing technologies and improve. Because people in the former Soviet bloc are starting fresh and are aware that what they had before generally didn't work, they are more open-minded than your typical American about trying new things.

IS managers in Eastern Europe are technically astute and eager to learn. They know that they don't know everything, so they are interested in learning. They are more open to new ideas [than their U.S. counterparts] and more capable of using them.

The most difficult obstacle to IS growth in upcoming years — the Postal Telephone and Telegraph authority (PTT) — also represents the largest opportunity. It takes a long time to get a telephone line in Eastern Europe. It takes an even longer time to get a leased line.

Though it varies from country to country, telephone services are expensive in addition to being scarce. Despite plans to deregulate in much of the former Soviet bloc, the PTTs generate taxes and revenue for their governments, which may be reluctant to bring in competition.

# Vinton Cerf

**Father of the Internet and co-developer of TCP/IP, the senior vice president for data architecture at MCI Telecommunications Corp. says he never dreamed the Internet would grow so huge when he defined a 32-bit address space for IP back in the mid-1970s. (The new version will have a 128-bit address.)**

## Q: Will the Internet ever become a major medium for commerce?

**A:** The answer is related to the Anthropic Principle in cosmology. In the case of the universe, we should not be amazed that we are here to ask the questions, "Where did the universe come from?" and "Isn't it amazing that life exists?" If the universe did not support life, we should not be here to ask the question.

In the case of the Internet, if it is to become a self-supporting infrastructure, it will have to support commerce. If it does not, then it will not survive, at least not in its present form. So, if the Internet survives, the answer is yes.

It seems to me almost inevitable that we will want to apply convenient computer cycles to the management of business and that doing business in a networked environment tends to enhance the utility of the network. Again, it seems inescapable that the Internet will become a major business infrastructure, or die.

Ian Byrnes

# Bill Gates

**Gates co-founded Microsoft Corp. 20 years ago with the advent of the first commercial PC. The firm's Basic interpreter was the first software product available for that machine. Gates also owns Corbis Publishing, a firm that buys digital image rights to millions of artworks and publishes them on CD-ROM.**

## Q: In which applications areas do you see the most innovation over the next two years?

**A:** I'd say Information at Your Fingertips [a long-term initiative that Microsoft instituted in 1990 to make information easily available to end users through enabling technologies such as client/server computing, OLE technology and several other technologies]. Take something like personnel systems. They used to be something that [only specialists in] some department in Microsoft used.

Today, I have Excel pivot tables where I can say, "How many engineers do we have across the company? How many do we have in this division? How has that changed?" The idea is taking what you think of as classic applications and making the data really accessible to business managers.

Everybody should be thinking about the Internet. That's more of a two- or three-year thing that requires taking internal systems and opening them up, with the right security, so that the boundary of the company almost disappears. This way, consultants, vendors, customers are all in the same information flow.

# Charles Wang

**Wang, chairman and CEO of Computer Associates International, Inc., wrote a book in 1994 called *Techno Vision* (McGraw-Hill, Inc.) about the dysfunctional relationships between technology and business executives. Since then, Wang has reached out beyond CA's customer base of chief information officers by sponsoring retreats at posh resorts to help CEOs learn more about the role of technology in their organizations.**

## Q: Will the CIO title still exist in 10 years?

**A:** The function of the CIO will exist, but it will take on new dimensions with the advent of new technologies. The sheer volume of users and information will greatly expand the role of a CIO.

The most important role of a CIO will be to provide the infrastructure — hardware, software, communications, policies and procedures — for businesspeople to maintain their competitive advantage. Instead of sitting on top of the glass house, the CIO will be intimately involved in aspects of the business that previously had been relegated to noninformation systems-centric business managers.

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# JUST 1 QUESTION

## Jerry Berman

**In Washington, sound bites about the privacy abuses of the Information Age come cheap. But Berman, founder of the Center for Democracy and Technology, is trying to negotiate real-world policy solutions to the privacy problems that others just talk about.**

**Q: Is greater loss of privacy inevitable as computers and on-line transactions proliferate?**

**A:** While there are new threats to privacy posed by the interactive world, there are also real possibilities for improving privacy rights if we can overcome some barriers.

For example, mass-market encryption, which can protect communications privacy and even give citizens the ability to exercise anonymity in political discussions, is around the corner. The issue is going to be whether we can reconcile the strength of the encryption available with law-enforcement needs.

Interactive technology can provide citizens with better ways to exercise control over information about themselves and what they want to expose themselves to. [If check-off boxes are provided on the screen], citizens can customize what comes into the home and block out the junk mail of the future. They can have viable options for opting in or opting out [of marketing campaigns].

I don't want to paint too rosy a picture. With so many companies doing business on the World Wide Web, there are many more companies collecting and using personal information. When you access a Web site, you're telling people a lot about yourself, and right now there are very few controls.

So there is a need for new privacy-protecting mechanisms. I'm not talking about new commissions. I'm talking about, for example, getting the Federal Trade Commission to become a privacy monitor on the 'net.

## Dawn Lepore

**With just 6,500 employees, Charles Schwab & Co. counts on information technology to make it competitive with brokerage houses many times larger. Much of this responsibility falls to Lepore, executive vice president and chief information officer.**

**Q: What challenges will IS face as a result of the explosion of new technology?**

**A:** I think the biggest challenges IS departments face is to be responsive to new technology and be able to adopt it early, while still maintaining the infrastructure to scale upward and do backup, recovery and other necessary functions.

There are times when you're going to err on the side of delivery and be optimistic about delivering new technology and other times when you're going to spend more time looking at the infrastructure. At any given time, you'll be overbalanced one way or the other — but over time, you have to maintain a balance.

Training — both educating the information technology staff on how to build and administer new systems and educating users on how to use them — is another challenge.

## Ron Ponder

**Ponder is senior vice president and head of the dozen or so chief information officers running information systems at (the pre-breakup) AT&T Corp.**

**Q: Will CIOs ever be in the same league as chief financial officers and chief operating officers as potential corporate leaders?**

**A:** As we transition to an information-based economy, companies are becoming increasingly dependent on information technology and information technology-based strategies to satisfy customers. This new competitive edge is quickly becoming part of the fabric of the corporate infrastructure.

Hence CIOs are at a point where their insight could be a key factor that elevates them to senior leadership levels. A critical determinant will be how CIOs make use of business insight and leadership skills along with [information technology] knowledge and expertise in setting business strategies that allow their company to be successful.

April 1, 2000

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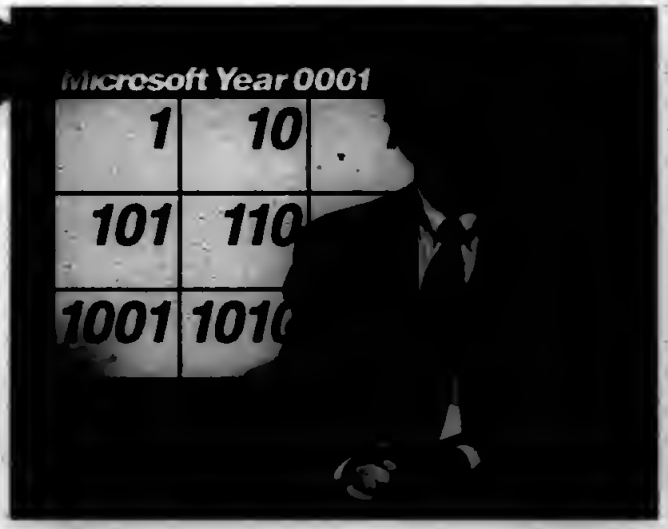
Special Preview

# Gates buys time




By Dan Richman

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Interactive at http://www.town.it/~all.com

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By Kim S. Nash

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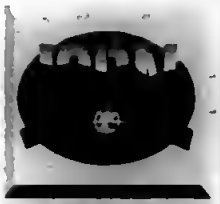

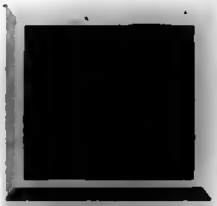

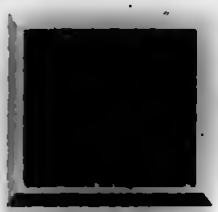

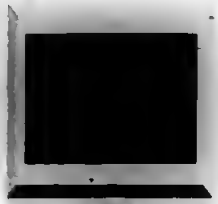

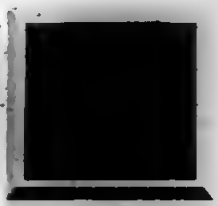

### ISDN set to take off

Supporters say it's really going to happen this time

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gain more ground as PC market slide continues

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PowerPC

(And modeling hasn't been quite the same since.)

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Solutions for a small planet

# Men overboard!

**You're at your desk starting out the new year and have just thumbed through our Forecast section. There you learned that the breakneck pace of technological change that rocked your world in 1995 will only increase in 1996.**

Now take this issue and hide it, quickly, before the IS rank and file get their hands on it. Give them some time-consuming assignment. Let them cruise the back alleys of the Internet for the week. Just keep them away from the employment forecast we have in our Careers section.

Why? Because there they will learn just what hot commodities they are and will continue to be for the foreseeable future.

The job market for IS professionals is as hot as it has ever been. Remember Odysseus in the Greek epic *The Odyssey*? He was lashed to the mast of his ship, while sirens all around him beckoned him to come hither. Now substitute "recruiters" for sirens and place your top IS people on the deck of the Argo. That's what the job market will be like in 1996.

According to our survey, conducted especially for this issue of *Computerworld*, the job market is hot just about everywhere in the country. It's only a matter of degree. There are companies with literally hundreds of IS positions, begging for help.

The driving force behind this situation isn't the economy, which is just limping along. Rather, it is the rush to build distributed, networked enterprise systems that leverage the Internet. Everyone is building a data warehouse. Everyone wants better end-user information access. Everyone wants to program visually, using stored objects in the process.

So everyone wants the people who are skilled to make all this happen.

This really could be the worst of worlds for IS managers. Discrete projects need discrete leaders, who may be the most vulnerable to being recruited away — like in the middle of a project.

The year ahead will test your personnel management skills as never before.

Your success may be determined not by your ability to manage technology but by basic blocking and tackling — namely, your ability to create and maintain a satisfying workplace.

Bill Laberis

Bill Laberis, *Editor in Chief*
Internet: *bill_laberis@cw.com*

## Shock headline

Have you resorted to profanity to sell your magazine ["So what the hell is OODBMS?" CW, Nov. 6]? More and more magazines are going to headlines and graphics that shock, tease and tantalize their audience. I am saddened by this trend.

To the casual reader, the word "hell" is one of the mildest profanities found in American English. But I find its placement in your magazine, especially in a headline, unnecessary.

Profanity, mild or not, has no place in business communications. I ask that you refrain from this practice in the future.

*Michael D. Robinette*
*Baptist Health System*
*of East Tennessee*
*Knoxville, Tenn.*

## Mercenary era

I am amused by the "more in sorrow than in anger" tone in which information systems executives and headhunters bemoan mercenary programmers ["Good help gets harder to find," CW, Nov. 13].

Is it surprising to anyone that the most sought-after skills are commanding big premiums? With SAP selling $1 billion in licenses annually, get ready for some market forces. If your company wants leading-edge technology, be prepared to pony up.

Of course, most IS professionals understand that today's hot ticket is tomorrow's commodity. We also know that the days of job security and loyalty between employers and employees have vanished. With these kinds of terms written into "the new social contract between programmers and employers," is it any wonder that those who can are making hay while the sun shines?

*Jim Rains*
*Westport, Conn.*
*dallmedd@aol.com*

## Portable problems

Your article "Finding peace in PC purchasing" [CW, Nov. 13] is right on the money, as far as it goes. But it focuses on desktop machines. Portables have the added problems of less scalability and shorter product-support cycles.

I look for manufacturers that provide capacity for more RAM than I could ever want and hard-drive upgrades beyond what is available. Our basic road machine starts with 16M bytes of RAM and a 1G-byte hard drive.

Another problem with notebooks is bloated device drivers for DOS/Windows 3.x. With several newer machines, users have encountered insufficient resources when running multiple Windows applications or even single applications with large data files. By contrast, the older machines functioned with no problems. In all of these cases, the only component that changed was a new machine with the factory-installed version of Windows.

For example, one manufacturer-supplied video driver is twice the size of the plain VGA driver. The stock vendor response to these problems is to recommend a move to Windows 95, which currently isn't an option.

*Douglas G. Moran*
*Information systems analyst*
*CRSS Constructors, Inc.*
*Denver*
*doug_moran@jacobs.com*

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931, Internet: letters@cw.com. Please include an address and phone number for verification.

*Jerrold M. Grochow*

# Client/server's future is on the Web

**Users will access new and traditional IS applications via the Web**

"I have seen the future, and it is the Web." I'm not sure which minister of computer science first exhorted that epithet, but today it is taking on new meaning. "I have seen the future of corporate IS and it is the Web." Traditional as well as new corporate applications will be delivered to end users via the World Wide Web — that is the future.

The Internet existed for almost 25 years before anyone outside of academia and the defense industry realized it. But as soon as banks, insurance companies, newspapers and government agencies started using it to communicate with customers, the Internet took on a new role.

Starting with FedEx, which connected its package-tracking system to a publicly accessible Web page, companies began figuring out that what used to be internal systems could now be "customer contact systems." For example, Wells Fargo Bank provides account balances and will soon accept payments via the Web. The Web is becoming *the* universal access mechanism.

Looking for a way to allow customers to check the status of their orders? Contemplating how to provide more direct support to your product clients? Analyzing strategies for making the data warehouse available to sales agents on the road? Trying to figure out how to bring multimedia training materials to your remote offices? Just put them on the Web.

The technical challenge is in merging the formerly internal-use-only strategic application with the Web, but the necessary tools are on the way. New versions of Hypertext Markup Language provide more complete and flexible graphical user interface (GUI) programming possibilities. Sun's Java and Netscape's LiveScript (soon to be combined into JavaScript) open the door to delivering full-fledged programs.

**Grochow's Web predictions for 1996:**

- Extensive use of Web technology to deliver internal business applications to internal users
- Widespread connections between externally accessible Web sites and internal systems
- Acceptance of security software sufficient to allow many financial transactions
- Use of JavaScript to deliver increasingly robust applications directly to Web users' browsers
- Competing browsers, servers and Web programming languages from Microsoft

Furthermore, Microsoft announced Visual Basic Script will be available in about a year. IBM/Lotus has a product to automatically scan Notes databases and put them onto a Web server. And a product from ParcPlace-Digital lets you substitute Web servers and clients for the traditional GUI of the Smalltalk object-oriented programming language. Before we know it, *every* language will allow (or encourage) co-existence and substitution of local GUIs and Web GUIs.

Web browsers accessing multiple Web servers is the architecture for the next wave of client/server computing. Carry this approach a little further and we will see the resurrection of big applications running on big servers that are accessed by "skinny" clients running Web browsers — the modern equivalent of massive time-sharing machines connected to thousands of terminals.

By the end of the millennium, we will see the start of the "Web-connected" society. And we owe it all to a 25-year-old networking protocol, coupled with some clever ideas on how to deliver graphics and data from CERN (the European Laboratory for Particle Physics) to the National Center for Supercomputing Applications.

Grochow is chief technology officer at American Management Systems Inc. in Fairfax, Va. His Internet address is jerry_grochow@amsinc.com.

*Jane Griffin*

# Turf battles trip up IS projects

**Fragmented IS budgets make it hard to fund enterprise systems**

At a recent luncheon with a Fortune 50 chief information officer, I commented that IS funding seems to be misplaced in many companies. The technology dollars are squirreled away in the various business departments, such as finance and marketing, making it hard to pool resources for common business goals.

The CIO agreed. His salad fork painted a vivid picture in the air as he explained how departmental turf battles in his own company led to some unwise investments and squandered opportunities.

For example, he described one department's purchase of an expensive system that was soon shelved. Instead of contacting other departments in the corporation that could use the equipment, the department locked the system in a closet, hoarding a corporate asset.

For this CIO and many others, IS funding is controlled departmentally, and that control is closely guarded. People in charge of large sums of money often exhibit aberrant behavior. Some hoard it. Others spend it foolishly, never considering a long-term strategy.

Yet many of today's most pressing technology investments — from data warehousing to wide-area networks — are horizontal and enterprise-wide in nature. These IS infrastructure investments require collaboration among the business departments that control pockets of IS dollars.

Getting that collaboration is difficult and time-consuming, especially when departmental rivalries get in the way. It may take years longer than necessary to build the needed infrastructure or a competition-beating strategic system — if it ever gets done at all.

**Politics get in the way**

IS departments have been beaten up for years for not delivering business value. But sometimes they are impeded by corporate structure, politics and budgets.

When someone comes along and says, "We need a corporate data warehouse," the response is, "Good idea, but who is going to pay for it?" Wide-ranging infrastructure projects are too expensive for any one department to fund, so the challenge is to get all of the affected departments to chip in.

Often, the first department that offers to help fund the project is asked to spend more than its fair share, so — not surprisingly — it balks. Then it has to sell the marketing, finance and other departments on the project's merits to share the financial load.

This fragmentation of technology budgets is one downside of the sometimes-fashionable trend toward decentralized IS.

The obvious solution is a centrally controlled IS budget — at least for the techno-infrastructure — and a commitment to cross-functional teaming. Actually, if everyone comes to the table ready to collaborate, you don't need to consolidate IS budgets. But if the departments aren't willing to chip in, then there must be a CEO-level command to pool resources.

Of course, even centralized IS budgets can be spent unwisely if the IS department makes purely technology-based decisions and ignores business needs. Last year, for example, a large corporation budgeted $50 million to transfer its worn-out, stovepipe systems to a client/server architecture, without business process re-engineering or consideration of the "future state" business model.

It may be easier to bury ourselves in a bundle of technology than to immerse ourselves in a partnership to embrace real change, but the battle to invest wisely in technology must be fought and won.

This isn't so much a battle over what to spend and who should spend it as it is a battle against fear — fear of losing control, the unknown and the consequences of putting the organization's needs first.

Griffin is president and CEO of Systems Techniques, Inc., an Atlanta-based IS consulting firm that specializes in business and data models and data warehousing. Her Internet address is jane.griffin@systecinc.com.

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NEW PRODUCTS, 62

# Desktop Computing

PCs AND SOFTWARE • PORTABLE COMPUTERS

# An NT Christmas

## Microsoft to ship Win 95 interface in '96

By Stuart J Johnston

An upcoming version of Windows NT that will add the Windows 95 user interface topped some users' lists of what they want from Microsoft Corp in the new year

Users have said repeatedly during the past 18 months that having a single, common user interface will greatly simplify training and technical support issues for firms that deploy Windows 95 and Windows NT They will get their wish by mid-1996, according to Microsoft officials

"Give me NT with the nice, Windows 95 user interface," said Kelly Dwyer, global information technology director at Braxton Associates in Boston, the strategy consulting unit of Deloitte & Touche Braxton and Deloitte have made major commitments to deploy Windows 95

"Having the Windows 95 user interface on NT Workstation is important so we can [combine] the two in our environment," said Brian Moura, assistant city manager for San Carlos, Calif

### Selling point

San Carlos has started to install Windows 95 but will consider NT Workstation for some users when it is released with the new interface next year One concern is the need for a common user interface Moura said

"I'd love to get NT with the Windows 95 user interface," said Don Barker, associate professor of information sciences at Gonzaga University in Spokane, Wash Barker is responsible for 85 PCs in the university's business school

Moura said San Carlos plans to take another look at NT next summer after the NT release ships If NT Workstation's performance is good enough, "we'd go to it for some of our users," he said

Once past that first item, however, users' wish lists are as different as siblings

For instance, Barker also is looking forward to that same update of NT because Microsoft in early December said it will bundle its Gibraltar Internet Information Server with NT Server for free in 1996 [CW, Dec 11] "We want to set up another [World Wide Web] site," Barker said

Moura is waiting for Microsoft's BlackBird authoring tools to be adapted to the Web The first release of BlackBird, an authoring tool for building on-line content without writing any code, will be out early in 1996 but initially will support only The Microsoft Network. A later release, also scheduled to be out sometime in 1996, will support the Web

Meanwhile, Microsoft's forthcoming Exchange messaging server tops the Christmas list for Greg Scott, information services manager in the college of business at Oregon State University in Corvallis, Ore

"What I really want, I'm getting, which is Exchange server," Scott said He said he will begin deploying a nearly final version of Microsoft's new electronic mail and messaging engine this week

**Dear Bill**

**A wish list of what IS users want from Microsoft in the new year**

| [illegible] | [illegible] | [illegible] |
|---|---|---|
| Windows NT update | Windows 95 interface | Q1 1996 |
| Exchange server | Global E-mail engine | First half of 1996 |
| Gibraltar Web server | Web page platform (bundled into NT server update) | Early 1996 |

**Downtime culprits**

**Failed components and percentage of users having them (Top 5 answers)**

Source: International Data Corp Framingham Mass

# Users want PCs they can rely on

By Jaikumar Vijayan

Users consider hardware reliability, and service and support the most critical criteria when they are buying a PC

A recent report from International Data Corp (IDC) in Framingham, Mass., shows that users consider these factors to be more important than functionality, features, price or brand reputation The report was based on a survey conducted by *PC World* magazine

"Because of the move to client/server, PC systems are now becoming much more relied upon by the general corporate user," said Paul Maszczak, director of information systems at C R. Bard, Inc in Murray Hill, N J

As a result, PC hardware reliability and support are getting "much fuller consideration from corporate users," Maszczak said PC hardware quality isn't declining, observers said, it is just getting more attention from users these days

"We are seeing it move up as important buying criteria," agreed Doug Chandler, an analyst at IDC "With customers moving so many applications to PCs, it has become more important not to have a PC break down," he said

Because of this growing focus,

**Reliability,** *page 62*

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The Nokia 447X has just been named a Best Buy by *PC World*. This adds to a long and growing list of awards and honors for Nokia monitors.

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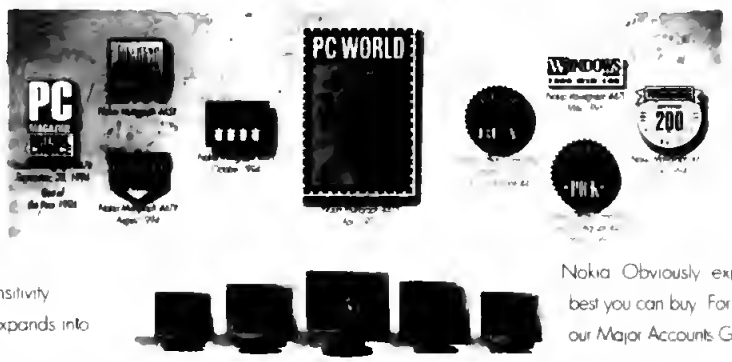


NOKIA MONITORS

# Vendor tries to simplify sales force automation

By Mindy Blodgett

The high rate of failed sales force automation projects has software companies scrambling for ways to make implementation faster and easier for customers.

According to industry analysts, as many as 75% of sales force automation projects fail. Those projects can cost hundreds of thousands of dollars to implement. One of the main reasons they fail is the length of time it can take to implement a program, observers said.

To keep user interest levels up, vendors now realize they must address these issues, and fast.

**Help on the way**

James Dickie, an analyst at Insight Technology Group, Inc. in Boulder, Colo., said several companies, including Aurum Software, Inc. in Santa Clara, Calif., and Siebel Systems in Menlo Park, Calif., are working on products with more open standards and ease of use.

SalesKit Software Corp. in St. Louis also claims it has an answer. Version 5.1 of its SalesKit Open package offers the Rapid Product Deployment method, which the company claims can have sales force automation projects up and running in days or several weeks.

The key to the fast rollout is an extensive object library of more than 2,000 objects, including calendaring, business data, contact management and forecasting.

The library comes with a kit that lets users modify and customize the system.

**Features of SalesKit Open:**

- Uses a Microsoft-based business object library to help deploy sales force automation.
- Interacts in real time with commercial databases such as Oracle Financials.
- Accesses several databases, including Microsoft SQL Server, Oracle, Informix and Sybase.

The typical sales force automation rollout takes several months, Dickie said.

"We took a look at 325 projects last year, and we found that 77% of [sales force automation] projects were late on average by 7.1 months," he said. "We have a lot of clients who [would be] very interested in a project like this if they don't have [to take] 18 months to get a project up to speed."

The flexibility of the SalesKit Base System means users can customize the product without altering the underlying code of the data model, company officials said. The process is called authoring — screens are data-driven, so altering data involves system tables, not source codes.

This is important for fast deployment, Dickie said. "You don't want 500 versions of the source code," he said. "You want to separate the functionality code from the look-and-feel code."

Peter Keers, sales and marketing information manager at St. Jude Medical Inc. in St. Paul, Minn., uses SalesKit Open 4.3. He said he is considering upgrading to Version 5.1 for the 40 or so mobile users at his company because of the ease of customization.

"The new version has a much more relational database," Keers said.

"Right now, we have some data connections that are a bit strange. It would be much easier to set up relationships. For instance, one of the focuses we have is on hospitals. We call on both physicians and hospital administrators in a hospital, but connecting the data on the two groups is kind of difficult now," he said.

The software also is made more open by incorporating Microsoft Corp.'s Visual Basic and Visual C++ object libraries. SalesKit Open also uses a Microsoft-centric object-oriented model. The kit costs $699 per user and $14,999 per server.

# Reliability

CONTINUED FROM PAGE 61

a number of top vendors are beginning to implement strategies aimed at boosting the overall quality of PC hardware and support, analysts said. "PC vendors are finding that to validate themselves in mission-critical roles, they have to differentiate on service and support," said Joseph Ferlazzo, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H.

**Punch list**

According to the IDC report, vendor strategies in this area include the following.

- Companies are investing in automation tools and technologies to improve service delivery. For example, companies such as IBM and Compaq Computer Corp. are bundling remote communications software with every PC. Such software lets companies remotely access customer PCs to do things such as remote diagnostics and support.
- PC companies are investing heavily in automation tools in their internal support infrastructures. Compaq, for instance, uses a help desk automation system based on case-based reasoning technology. Support staff can access information based on thousands of hours of engineering and problem-solving expertise.
- Vendors are making systems easier to use with better graphical user interfaces, point-and-click features and plug-and-play capabilities.
- Flexible support programs are aimed at giving users a range of choices. For instance, Dell Computer Corp.'s SelectCare service offerings let users choose varying levels of service and support, including certified self-maintainer programs, from a wide range of choices.
- Life-cycle services. These go beyond traditional support offerings by giving customer organizations the ability to off-load some or all distributed systems management functions for a set fee. A growing number of companies, such as Hewlett-Packard Co., Digital Equipment Corp. and IBM, already offer such services.

In a bid to keep component failures to a minimum, top vendors are also beefing up hardware quality through extensive testing and by procuring top-quality parts from reliable suppliers, said Doug Chandler, an analyst at IDC. "There is a direct connection between product reliability, service and support. If something breaks down, customers need to be able to fix it quickly, easily and at the lowest cost as possible," he said.

The IDC report also concludes that despite the popular notion that PC brands aren't very different from one another, reliability differs significantly from vendor to vendor. Buying cheap could mean big problems later on. When it comes to overall reliability, the Top 5 vendors in the PC business were Apple Computer, Inc., Compaq, HP, Digital and Dell, the study found.

"You get what you pay for. My experience is that if you get a cheap, no-name computer, you probably are going to have a problem — you can get bargains only up to a certain point," said Dennis Guarriera, an independent consultant and former computer consultant to the city of New York. "Overall, though, I would say that hardware reliability is getting better these days."

[redacted]

**MindWorks Corp.** has introduced Recollect Gold, a desktop document imaging software tool.

According to the Sunnyvale, Calif., company, Recollect Gold gives users instant access to paper-based information by letting them scan, import, search for or manage documents. It includes fuzzy logic search technology and document portability features that let users move documents from a desktop to a laptop computer.

Recollect Gold was designed to handle forms and invoices and lets users create and store templates that indicate which regions of a form contain the information needed. When forms are scanned, the product recognizes the form, applies the template and indexes the document.

The product is compatible with Windows 3.1 or later and requires 4M bytes of RAM. It costs $499.

▶ *MindWorks (408) 730-2100*

**Tadpole Technology, Inc.** has introduced AlphaBook 1, a notebook computer driven by Digital Equipment Corp.'s Alpha 21066 microprocessor.

According to the San Francisco company, AlphaBook 1 has the computing power of a Digital Alpha workstation, including support for the OpenVMS operating system, in a rugged 7.5-pound notebook.

It features an integrated Peripheral Component Interconnect system bus interface, PCMCIA and SCSI interfaces. Removable 2½-in. SCSI-2 hard disk drives are available in 520M-byte, 810M-byte and 1.2G-byte capacities.

AlphaBook 1 includes a 3Com Corp. Ethernet card and supports an optional 28.8K bit/sec. fax/modem PC card.

Pricing starts at $13,950 for a system bundled with OpenVMS, the Ethernet card, 32M bytes of dynamic RAM and a 520M-byte hard disk drive.

▶ *Tadpole Technology (512) 219-2200*

**Product shorts**

**Maxi Switch, Inc.** has introduced the Nova 9500W, a Windows 95 keyboard with rounded corners, an applications key for recalling the context menu and two Windows keys for accessing the Windows user interface. Cost, $22. Maxi Switch, Tucson, Ariz., (520) 746-9378. **Group 1 Software, Inc.** has announced StreetRite 4.2. StreetRite lets users standardize and correct address data to improve mailing accuracy. Pricing starts at $295. Group 1 Software, Lanham, Md., (301) 731-2300.

## Briefs

### Firms sign with IBM

**Four leading suppliers of office products and computer equipment — MicroAge, Inc., Staples, Inc., Stream International, Inc. and Uareo, Inc. — will make their catalogs available on IBM's forthcoming Electronic Purchasing Service. The service links buyers and suppliers electronically. It is slated to go live in 1996.**

### Stage3 backup boost

**Boole & Babbage, Inc. is shipping Stage3, a Windows NT-to-mainframe backup program. Stage3 extends the services of Arcada Backup Exec, a Windows NT backup program, by sending backup files to an IBM MVS mainframe via Microsoft Corp.'s SNA Server or a TCP/IP link. Pricing begins at $7,500 for the MVS mainframe component and $2,900 for the LAN segment.**

### New notebook from Zenith Data

**Zenith Data Systems has released the Z-Star 486 DX4/100, a low-end notebook computer. For just under $1,600, it has Windows 95 capabilities, 4M bytes of memory, dual-scan color video and space for a PC Card Type III slot. It weighs 6 pounds. It is available now.**

FIRMS ADDRESS LAN-BASED DISASTER RECOVERY, 64
HYPERDESK OFFERS PROJECT MANAGEMENT PRODUCT, 64

# Workgroup Computing

LANs • SERVERS • SOFTWARE FOR GROUPS

# Lotus supports CC:Mail users while continuing its client/server push

By Tim Ouellette

Lotus sees client/server as the future of messaging but will let its CC Mail users take their time getting there

With the Dec 13 introduction of feature-rich client/server mail and price cuts to Notes, Lotus Development Corp is providing an enticing reason to move to client/server messaging on Notes

Add to that pending updates to CC Mail (see chart) and users have several messaging options. They can stick with the familiar file-sharing architecture of CC:Mail, move to a client/server version of CC:Mail or move to database-oriented Notes Mail

Client/server messaging systems move more processing to the server, freeing up client processing. This lets mobile users set rules to sort their mail on the server side, so when they log on, the laptop doesn't have to process all their mail messages, for example

**E-mail strategy**

Several users interviewed showed interest in Notes Mail, though they said they will take their time evaluating and installing the software. One user still loyal to CC Mail said he is frustrated by recent CC Mail upgrade delays.

"We've been burned a couple times," said Thomas Bridges, network administrator at the Internal Revenue Service in Austin, Texas, which runs Notes and CC:Mail. "They've blown their credibility on their schedules. I have a vested interest in CC:Mail, and I am still ready to throw it out."

But one analyst cautioned against moving to Notes too fast. "If CC:Mail is working for you, stick with it. If you have areas where you need Notes, install [it] in departments where you need it, and wait out the storm," especially if server prices drop, said Tim Sloane, an analyst at Aberdeen Group, Inc in Boston

Then again, those with a large number of CC Mail users may feel left out in the cold as Notes 4.0 makes its way into companies. Client/server CC Mail 7.0 clients will be hosted by a Notes 4.0 server, but older versions of CC Mail clients won't be directly supported. Instead, these older versions can connect to a Notes environment via the CommServer message transfer agent, Lotus spokesmen said

**Customer support**

But Cambridge, Mass.-based Lotus said it will support whatever its CC:Mail users choose

"We are continuing to invest in CC Mail," said Larry Jones, group product manager for Notes messaging at Lotus. "We are providing a full-feature set of tools to migrate to client/server systems or to integrate existing systems."

"That's a wonderful thing to hear about. We need to know deploying CC Mail will be OK," said Anthony Citrano, information services manager for the state of Maine. Maine is currently rolling out CC:Mail to all of its state employees, but Citrano said there are plans to add Notes to the mix

But the extra capabilities of Notes Mail, including a subset of Notes, and what users and analysts say is a reasonable price make the inducement pretty strong. Under the new pricing scheme, a stand-alone version of Notes costs $55

"The idea is that users are going to buy mail anyway, so why not get E-mail along with Web access and document management and workflow and full Notes?" said David Marshak, an analyst at Patricia Seybold Group in Boston.

"The nice thing is there will be choices — CC:Mail will continue to offer some nice options, and not everybody will go to Notes," said Judith Rosall, president of Worldscape Strategies, a consultancy in Half Moon Bay, Calif. She said the same thing will happen with Microsoft Corp's Mail, which won't necessarily go away with the release of Exchange in early 1996

**Mail users, take note**

**Lotus will continue to support its CC:Mail software based on file-sharing technology, while promoting use of client/server systems. Options will include the following:**

| Product | Availability | Feature |
|---|---|---|
| CC:Mail 2.x/3.x | Now | Widely installed traditional file-sharing E-mail system |
| CC:Mail 6.0 | December 1995 | Upgrade for 2.x and 3.x systems; eliminates system downtime |
| CC:Mail 7.0 | Early 1996 | Client/server version of CC:Mail; attaches to Notes server or a file-sharing back end |
| Notes Mail client | December 1995 | Client/server mail that ships with Notes 4.0 or as a $55 stand-alone system. Borrows CC:Mail interface. |

# WinFax Pro 7.0 faster, fuller and first-rate

## But hardware problems confound TalkWorks add-in

By Howard Millman

The increased performance, reliability and extensive feature set of Delrina Corp's WinFax Pro 7.0 make it especially well-suited for use in the enterprise.

This version integrates elements of faxing, electronic mail and graphics applications.

**Imperfect match**

With the introduction of the new TalkWorks voice messaging add-in, however, Delrina must wrestle with incompatibilities between its software, modems and Windows 95

Among the 100 or so new features in WinFax Pro 7.0, the most important gains come from leveraging Windows 95's multitasking capabilities. For example, Windows 95's preemptive multitasking lets users reliably transmit and receive faxes in the background while they work on something else in the foreground. Under Windows 3.x's cooperative multitasking environment, background faxing often resulted in a disconnect when the foreground task demanded too many CPU cycles

**Review**

Improved data compression will reduce transmission time by up to 50% when transmitting to a fax machine or another computer running WinFax Pro 7.0. In our informal tests, faxes went through in about one-third less time than they did with the predecessor, WinFax Pro 4.0. We used a 66-MHz 486DX2 clone with 16M bytes of RAM for our review, complying with Delrina's recommended hardware configuration.

Stability has likewise improved. Even when we accidentally locked up our machine by opening too many DOS programs, faxing continued in the background

WinFax Pro 7.0's tight integration with Windows 95 includes support of Microsoft's extended Messaging Application Programming Interface (MAPI). One benefit of this tight integration allows WinFax Pro 7.0 to handle fax, binary and — with a voice-enabled modem — voice messages. Delrina said WinFax Pro 7.0 will work with any E-mail package that supports extended MAPI

Telephony Application Programming Interface (TAPI), another Windows 95 feature that WinFax Pro 7.0 supports, manages call discrimination. In other words, TAPI samples incoming calls and determines if it is a fax, data or voice message. Depending on the receiving machine's hardware, TAPI routes the call to the associated application. This feature worked well in our tests

We also compared Window 95's built-in faxing application to WinFax Pro 7.0's. Some of the key differences between the two programs include WinFax's number, viewer, its Preview function and its Xerox Corp TextBridge optical character recognition (OCR) utility

Moreover, our tests of WinFax Pro 7.0's OCR utility pro-

**Millman,** *page 64*

# Firms offer LAN-based disaster recovery service

By Thomas Hoffman

Mission-critical client/server systems continue to explode across America's corporate landscape, yet scant attention has been paid to recovering data in these environments when disaster strikes, experts say

To help address this conundrum, IBM Business Recovery Services in Sterling Forest, N.Y., and Comdisco Disaster Recovery Services in Rosemont, Ill., have recently introduced LAN-based disaster recovery services.

The lack of corporate attention is due, in large part, to the inexperience of departmental business managers who have inherited responsibility for these systems, analysts said.

Disaster-savvy information systems managers, with years of glassbouse mainframe security expertise, often have little control over departmental systems. They are left to act as little more than absentee landlords.

And even in those situations where IS happens to preside over LAN-based data, the task is complex Organizations may have bundreds of servers and thousands of workstations scattered across multiple time zones.

To help IS staffs address this, IBM's LANProtect service "is 'productized' and packaged so that a user knows exactly what they're going to get and what it's going to cost," said Fred Joy, an analyst at Meta Group., Inc in Stamford, Conn.

### New package

Although LAN-based services from IBM and Comdisco aren't new, the simplified packaging is, analysts said

For example, within 24 hours of declaring a disaster, IBM LANProtect customers receive on-site installation of their basic LAN configuration, including a preloaded operating system and 48 hours of on-site technical support. Each Intel Corp.-based LAN configured with up to 24 workstatiuos is covered for $360 per month, while Unix-based LANs are priced at $550 per month.

That type of modularity appeals to Baxter Healthcare Corp In January, the Deerfield, fil., firm will begin testing the IBM service at one of its 350 remote locations The $10 billion medical products firm is halfway through a migration from an IBM SNA mainframe network to a client/server-based IBM TCP/IP LAN scheme

IBM's plans to offer customers multiple-site discounts "is a signal to me that they want to make this [LANProtect service] an enterprise solution for companies," said Randy Johnson, manager of disaster recovery planning at Baxter Healthcare's corporate data center in McGaw Park, Ill.

For its part, Comdisco formally announced that its host-based Advanced Recovery Services have been extended to include coverage of LANs and distributed systems. Users of the Comdisco service will be able to back up their systems nr database transaction data to a Comdisco site either through a Comdisco Synchronous Optical Network-based network nr through a public network.

### ... And a partridge in a pear tree

**IBM's LANProtect package includes three days of test time on a subset of the recovery configuration. A preconfigured LANProtect package includes the following:**

- One file server
- 24 workstations
- One printer
- One tape drive
- Two Hayes-compatible 28.8K bit/sec. modems
- Preloading of operating system
- LAN installation during disaster
- 48 hours on-site support during disaster

**Spicer Corp.** has introduced Imagenation 4.0, a document imaging tool.

According to the Kitchener, Ontario, company, Imagenation 4.0 is technical document imaging software that lets users view, redline, mark up and edit files. It can handle overlays, multipage documents, gray-scale images, mixed page formats and sizes within a document. It supports more than 100 industry-standard file formats for computer-aided design, raster, color and text.

Imagenation 4.0 includes an Expand feature that leta users access individual AutoCAD or Intergraph layers and control their color and visibility.

Pricing for Imagenation 4.0 starts at $199 for Windows, Macintosh and Unix versions.

▶ *Spicer*
*(519) 748-2462*

**Teamaker Corp.** has unveiled Office Hours.

According to the Portland, Ore., company, Office Hours is client/server software that gives networked users access to information about where and how to locate team members. It includes four functions, an I/O board for locating people; a browser that displays extensions, pager numbers, cellular and home telephone numbers; a Timecard that provides productivity and billable hours analyses; and a Calendar that lists upcoming company events and functions.

An installed copy of Office Hours provides access for up to 50 users per oetwork server. It is curreotly available in a 16-bit Windows version

Office Hours costs $150 per server copy.

▶ *Teamaker*
*(503) 520-5050*

# HyperDesk offers product for managing small projects

By Suruchi Mohan

HyperDesk Corp. recently introduced its GroupWorks 2.0, a task organizer for small teams of people working together.

GroupWorks lets users share, edit and annotate documents. It allows users to put all information about a project into one location for quick access. GroupWorks was designed for simple projects, including organizing a company party or working together in groups to create a proposal for a customer, for example.

GroupWorks helps "create a common area of communications for projects we're working on," said user Tim Lucas, president of Lucas Associates, Inc., a consulting firm in Grenada Hills, Calif.

**Project management**

### The customer's way

Most customers have their own preferences for spreadsheets, word processors or schedulers. GroupWorks takes all that information, centralizes it and organizes it for a project. In essence, it creates a common workplace for people on a project.

"I can't tell you how many hours in a day are lost in organizing documents," Lucas said. "GroupWorks drops [all documents] into a repository, and people can annotate them."

Documents created using different software work in two ways: They can be attached to a view as OLE objects or as images.

But while these features work well for simple tasks, this product suffers, like every product in the groupware arena, from a comparison to Notes — a collaborative computing environment. GroupWorks, however, doesn't pretend to compete in the same category.

### A different approach

"GroupWorks is different from Notes or project management," said Ronni Marshak, editor in chief of "WorkGroup Computing Report," published by Patricia Seybold Group in Boston "It is a personal environment for nrganizing work on a project basis.

"If you're trying to get scientists to speculate on the origin of the universe, Lotus Notes with its discussion databases might be better," said Jim Garden, director of syndicated services at WorkGroup Technologies, Inc. in Hampton, N.H. But if users are trying to collaborate on a simple project, GroupWorks might be the better choice, he said.

Other features include search filters, import/export abilities, Vendor-Independent Messaging and Messaging Application Programming Interface support and color-coded outlines.

GroupWorks will have a street price of $199 for the first license, whicb includes unlimited free team trials, and $99 for every license thereafter.

# Millman

CONTINUED FROM PAGE 63

vided satisfactory results. On average, it correctly identified 95 out of 100 characters. Conversion took less than 30 seconda per page.

If we have any misgivings about WinFax Pro, they are related to feature glut. For example, despite WinFax's overall speedier performance, we noticed it took much longer to load

### An easier route

Still, for the occasional user, Delrina provides some shortcuts. A Send Wizard simplifies transmitting faxes. Also, a built-in macro establishes WinFax as an option in Word's and WordPerfect's drop-down file menus.

Ease-of-use improvements include OLE 2.0 support, which allows users to send faxes by dragging and dropping documents from Explorer onto WinFax's tag on the task bar. Users with pagers can set WinFax to automatically notify them of received faxes or messages.

Our experiences with the late beta version of TalkWorks pointed out the difficulties in integrating products from multiple vendors. We separately installed two internal modems, Zoom Telephonics, Inc.'s 28.8K bit/sec Comstar and Creative Lab, Inc.'s 14.4K bit/sec. Phone Blaster. We experienced problems, including communication port conflicts, failure to open or close the telephone line, poor sound quality and dropped carrier. Part of the problem seemed to track to Window 95's mercurial Plug and Play

### More needed

We finally got TalkWorks running. TalkWorks could evolve into a useful application but currently lacks critical features.

For example, we would like to see password protection for stored messages, easier access to custom messages and a display that shows messages for all mailboxes rather than individually. Delrina has acknowledged room exists for improvement and indicated it will add features in forthcoming upgrades.

Let's hope Delrina doesn't overdo it.

Millman is based in Croton, N.Y. He operates the Data System Services Group, a networking and problem-solving consultancy. He can be reached at hmillman@[illegible].

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# One WAN for all

## Industrial company moves from phone and fax to mix of vendors and services for international communication

By Neal Weinberg
STONEHAM, MASS.

Two years ago, when Paul Hoogenboom became director of communications at A. W. Chesterton Co. in Stoneham, Mass., the company's wide-area network consisted of telephones and faxes.

Not that the 110-year-old maker of industrial seals, pumps and gaskets didn't need a more sophisticated system. With manufacturing plants in Ireland, Mexico and Massachusetts, and a global sales and distribution operation, its workers wanted a WAN that could do it all: electronic mail, Internet access, trans-Atlantic high-speed data connections and wireless and dial-in links from anywhere in the world.

Hoogenboom's strategy has been to use every method at his disposal, including threats, to get as much as possible out of AT&T Corp., the vendor he inherited when he joined A. W. Chesterton. And when AT&T comes up short, Hoogenboom moves to other service providers.

**Carrier services**

The result is a mix of frame-relay service for long-distance data transfer, Integrated Services Digital Network (ISDN) lines for Internet access and leased lines to connect four nearby sites in Massachusetts and provide global dial-in service to laptop users.

While Hoogenboom isn't an AT&T zealot, he decided to stick with the vendor to protect A. W. Chesterton's investment. Other reasons included AT&T's technological prowess and a new, more attentive attitude from the Basking Ridge, N.J.-based company.

Hoogenboom's faith in AT&T was sorely tested when he ordered a frame-relay connection between Dublin and Stoneham in June 1994 and was still waiting for it in December.

At that point, he gave AT&T an ultimatum: a frame-relay connection in two weeks or all the AT&T equipment gets thrown out.

Hoogenboom got frame relay for Christmas that year, and from then on, AT&T has responded to his requests "extraordinarily quickly." He went on to add a frame-relay connection between Stoneham and key sales offices in Chicago and New Orleans.

But AT&T couldn't provide global dial-in connections for A. W. Chesterton's mobile sales force of about 275 people, so Hoogenboom decided to use GE Information Systems for a private, high-speed network based on X.25 packet technology.

**Other sources**

Hoogenboom also is negotiating with vendors for global wireless services that AT&T doesn't offer. He said his remote sales force needs wireless connection when traveling in locations where the telephone system is unreliable.

**A. W. Chesterton's Paul Hoogenboom** *has helped the company get a WAN that does it all: E-mail, Internet access, frame relay and dial-in links*

For the Internet, Hoogenboom decided to use a local access provider, which gives him a 128K bit/sec. ISDN link. He uses the Internet for E-mail and is putting up a home page.

Looking ahead, Hoogenboom plans to run voice traffic over his international frame-relay connections — first from Dublin, then from Mexico. That will save an estimated $6,000 to $8,000 a month, he said.

He also plans to extend A. W. Chesterton's domestic frame-relay network to additional sales offices. And with an eye toward electronic commerce, he would like to increase the company's use of the Internet, he said.

# The old switcheroo: Costs drop, but switching prices rise

By Bob Wallace

The cost of LAN switches is plummeting, but information systems managers may end up spending more, not less, on switching.

Because of falling prices, more business units and departments are buying their own switches. They are doing this without an eye toward corporate technology direction.

This makes those departmental purchases bad buys.

And bad buys are bad news because IS managers often must spend additional money for gear that enables the department's switches to work with the corporation's switches. In extreme cases, the departmental switch must be prematurely replaced.

"False starts and write-downs are nightmares for IS managers," said Tom Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J.

Analysts say bad buys create the following problems:

**LAN switching prices**

| Vendor/Switch | Switch module type/number of ports | Price per port |
|---|---|---|
| 3Com LANplex 6000 | Switched TR/8 | $1,687 |
| | Switched Ethernet/6 | $1,000 |
| | Switched FDDI in one module/2 | $4,000 |
| Cabletron MMAC-Plus | Switched Ethernet/24 | $579 |
| | Switched FDDI/8 | $2,197 |
| Cisco Catalyst 5000 | Switched Ethernet/24 | $435 |
| | Switched FDDI/1 | $9,995 |

Source: 3Com Corp., Santa Clara, Calif.; Cabletron Systems, Inc., Rochester, N.H.; and Cisco Systems, Inc., San Jose, Calif.

• **The technology mismatch.** For example, a corporation is moving its switching architecture toward Asynchronous Transfer Mode (ATM); but a department buys an Ethernet switch that won't work with ATM.

• **The network management nightmare.** A department buys switches that can't be adequately managed, or managed at all, from the company's network management system.

• **The failing vendor headache.** A unit buys switches from a company that goes under or hits a technology dead end after it is bought out.

Blair Sanders, a senior member of the technical staff at Texas Instruments, Inc. in Dallas, said he hasn't run into any bad buys so far, but they exist and can cause problems.

"If that were to happen, our general rule would be to say to that department, 'You manage your side of the router, and we'll handle ours.' That would at least shield the rest of the corporation from any problems on the other side," Sanders said.

Another user said limiting departmental and business unit buying to PCs and workstations is a solid solution to the bad buy problem.

"We at corporate buy all the other equipment and bill-back end users for network connectivity as well as service and support," said Paul Watson, director of network systems at Commercial Union Insurance Cos. in Foxboro, Mass. "Limiting the size of their budget limits what they can buy and addresses this problem."

Switches, *page 71*

# Stalled on the I-way

## Many still confused by Internet and networking technology

By Suruchi Mohan

Manually sifting the wheat from the chaff may be easier than separating the hype from the reality of the Internet.

Users watching packets fly by on the information superhighway certainly find it a daunting task.

"I don't know what questions to ask," said Tom Cavagnaro, a systems administrator at Boston University Hospital in Boston. "I don't know how to run [the Internet]. There is no need to run it in the workplace."

This sentiment was echoed by many others, who asked not to be identified, at the recent E-Mail World conference in Boston. For example, one user said, "I still can't understand why I can't keep my corporate network up. How will we get it to work smoothly with a mishmash of Internet products?"

However, he added that even though he was just exploring the on-line world, the availability of development tools might aid the process of getting his organization onto the Internet.

But Mark Gibbs, president of Gibbs & Co., a consulting firm in Ventura, Calif., said he is "tired of hearing how hard it is to learn" to use the Internet. "Why don't [users] bite the bullet and learn how to use it? People tend to be limp about it. It's pathetic," he said.

**Clear course**

"Companies have the attitude that their staff will abuse the system," said Mark Gibbs, president of Gibbs & Co. Businesses need to develop a user culture that promotes effective use of the Internet by setting guidelines for access and making security provisions clear, he added.

As users try to figure out the technology, vendors are seeking to outdo one another by offering gee-whiz features. The trend here seems to be to embed uniform resource locators in an electronic-mail message so that when users click on it, they are immediately transported to the relevant World Wide Web site.

Banyan Systems, Inc.'s BeyondMail for SMTP, Lotus Development Corp.'s InterNotes Web Navigator and a product from InterCon Systems Corp. all offer this feature.

And in an effort to make corporate mail easily accessible, vendors are providing the ability to retrieve mail from the company server over the Internet. Lotus in Cambridge, Mass., and Infinite Technologies in Owing Mills, Md., separately announced in September CC:Mail for the Web and WebMail, respectively. WebMail supports CC:Mail and Microsoft Corp.'s Mail. Further, Lotus announced it has made the Internet the new focal point for its strategy [CW, Dec. 18].

"It's not as much hype any more," said Judith Rosall, president of Worldscape Strategies in El Granada, Calif. "Software companies will bring end-user companies onboard because they'll be guided." This means companies such as Lotus will be able to help customers leverage their existing technology to access the Internet.

But industry watchers advise caution because, with this kind of access, what will stop corporate data from flowing out? Companies can build firewalls to prevent unauthorized entry to their databases, but disgruntled employees can cause great damage by copying information onto disk, said David Ferris, president of Ferris Research in San Francisco.

# Browsing for spreadsheets

By Kim S. Nash

Users of Netscape Communications Corp.'s Navigator browser will be able to view and manipulate spreadsheets on the World Wide Web now that Visual Components, Inc. is shipping an add-on module that helps do just that.

With Web browsers, users typically can't see anything but Web documents. But this tool lets users embed spreadsheet tables with calculated values from outside the Web into Web applications, which then can be viewed with a Web browser.

**Visual Components' Formula One/Net** *will let users who, say, buy mutual funds over the 'net calculate what-if scenarios*

For example, a company that sells mutual funds over the Internet may want to give Web-using customers the ability to calculate what-if financial scenarios while they are browsing the site. Or firms that sell products on-line could let users run a tab that appears in the form of a miniature spreadsheet within their browsers.

The product, dubbed Formula One/Net, is one of the first spreadsheets built for Navigator since Netscape published its application programming interfaces several months ago.

**How much?**

Formula One/Net will come in two flavors: a $39 end-user version for plugging into Netscape's Navigator to view on-line spreadsheets; and Formula One/Net Pro, a $79 product that helps developers who are building Web applications handle spreadsheets.

Users can download the product from Lenexa, Kan.-based Visual Component's Web site at http://www.visualcomp.com.

# http:

**Netscape plug-ins**

Netscape published an application programming interface for its Navigator 2.0 browser, known as NSAPI, several months ago. Since then, a handful of software makers have built add-on modules for Navigator that support NSAPI; they are called plug-ins. Progressive Networks, for example, offers a plug-in that lets Navigator users hear audio from the Web.

- The University of Illinois at Urbana-Champaign (which spawned Netscape founder Marc Andreessen) has created a good overview of plug-in basics and tips on how to extend Netscape Navigator 2.0 at **http://wx.ag.uiuc.edu/AIM/2.0/rsrc/2.0ll.html.**
- Plug-Ins Centre is a Web site with links to the latest commercial plug-ins, such as Corel's CMX Viewer. The product was designed to let Web surfers look at complex vector graphics through their browsers. See **http://plugin.hoenweb.com/.**
- Netscape's home page offers information about plug-ins at **http://www.netscape.com.** Users can download an NSAPI developer's kit from **http://www2.netscape.com/comprod/development_partners/plugin_api/index.html.**
- For some old-fashioned learning, Web surfers can peruse *Netscape Quick Tour*, a reference book from Ventana Press, that includes a detailed section on plug-ins. To order, go to **http://www.vmedia.com/.**

*– Kim S. Nash*

**Brief**

**Support for 'net commerce**

Sterling Software, Inc. recently launched a series of initiatives to support electronic commerce on the Internet. The Dallas-based software vendor has licensed an encryption system from Tecsec, Inc. in Vienna, Va., and is developing an Internet security system called EC Gateway. Both products, along with a new set of electronic-commerce services, will be available in January.

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## Briefs

### Cinco adds NT analyzer

Network managers and application developers who prefer Windows over Unix can add a protocol analyzer to their tool kits. Atlanta-based Cinco Networks, Inc. upgraded its NetXRay analyzer and network monitoring software recently, adding a version for Windows NT. New capture/decode support covers Token Ring and 100VG-AnyLAN networks.

### Middleware agrees

PeerLogic, Inc. in San Francisco and Sybase, Inc. in Emeryville, Calif., will make their middleware systems compatible. PeerLogic's Pipes Platform works over conventional networks, while Sybase's Enterprise Messaging Services is a wireless messaging system from the company's Complex Architectures division in Burlington, Mass. The compatibility project, which is slated for completion in the first half of 1996, will let customers seamlessly link networks based on the two middlewares, the companies said.

### IBM goes on-site

Gandalf Technologies, Inc., a remote access network equipment vendor recently announced it has struck a deal with IBM under which Big Blue will provide on-site maintenance for Gandalf products in the U.S. The Nepean, Ontario, vendor is best known for its remote LANaccess wares, which use Integrated Services Digital Network lines.

### E-mail gateways ship

SoftArc, Inc. in Markham, Ontario, is shipping gateways from its First-Class workgroup communication system for Lotus Development Corp.'s CC:Mail and Microsoft Corp.'s Mail. The CC:Mail gateway will be able to replicate the contents of CC:Mail bulletin boards to First-Class' workgroup conferences. The Microsoft Mail gateway connects to a single post office and routes messages to a system with several post offices. Both gateways cost $495.

### NT backs up to MVS

Boole & Babbage, Inc. has begun shipping Stage3, a Windows NT-to-mainframe backup program. Stage3 extends the services of Arcada Backup Exec, a Windows NT backup program, by transporting selected backup files to an IBM MVS mainframe. It uses LU6.2 links via Microsoft's SNA Server or a TCP/IP link to the MVS mainframe. Pricing for Stage3 begins at $7,500 for the MVS mainframe component and $2,900 for the LAN segment.

# Switches

CONTINUED FROM PAGE 67

Analysts say the issue won't go away.

"We're talking about an age-old problem, centralized control vs. distributed control," said Charlie Robbins, president of Aberdeen Group, Inc., a consulting firm in Boston. "But it's made worse by the fact that switching is seen as, and is, a panacea," he said.

**Consensus decision making**

Companies could form committees that include individuals from different units. These committees then could make buying decisions with the firm's overall technology direction in mind, Robbins said. Groups can gain flexibility by having the freedom to choose a vendor, as long as the product fits into the company's master technology plan.

The issue has left IS managers between a rock and a hard place.

After having promised investment protection to top management when shelling out big dollars for high-end switches (see chart page 71), IS managers then force the company to prematurely write down those lower-level department switches. This doesn't impress corporate higher-ups.


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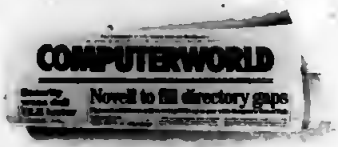



The Newspaper of IS

ORACLE RENEWS ITS RDB COMMITMENT, 74



# Where do you send the bill?

**Charge ahead**

Options that data centers have available for recovering client/server processing costs from user departments

| Flat allocations | Transaction fees | Telephone-style service | Cable-style service | Service level pricing |
|---|---|---|---|---|
| Uniform fees spread across multiple departments based on number of users, data center costs or other metrics. | A flat cost for each individual processing task, with prices based on the time it takes to complete a transaction. | A base charge for IS services along with additional costs for each transaction. | A bundle of services ranging from basic data processing for sophisticated departments to complete setups for less skilled users. | Fees derived from predefined service levels such as response time, help desk response or system availability. |

Source: Gartner Group Inc., Stamford, Conn.

By Craig Stedman
PHOENIX

Data center managers struggling to care for numerous servers have more to worry about than a lingering lack of mainframe-like tools. Figuring out how to divvy up the processing bill in a client/server environment also is proving to be a tall order for some shops.

The chargeback to end users for mainframe use has always been rather cut-and-dried. Big consumers of CPU and disk space pay accordingly, and there are plenty of tools around to help measure usage and tally up the bill.

**Data centers**

But things aren't so simple in the client/server realm, according to users and analysts at a Gartner Group, Inc. data center conference held here recently.

"It tends to be a little ad hoc," said Mike Maggs, vice president of technology at Bell Sygma, Inc., the information systems and outsourcing arm of Bell Canada, Inc.

Toronto-based Bell Sygma charges its client/server users flat-rate fees based on a malleable combination of factors such as data center personnel costs, sys-

Data centers, page 74

## System keeps Central American elections fair

By Dan Richman

In May 1994, the Central American republic of Panama held its first free elections in 23 years, and a newly installed computer system was critical in ensuring their legitimacy.

This country of 2.4 million people had suffered under military strongmen since 1968, the year democratically elected president Arnulfo Arias was overthrown by dictator Omar Torrijos. After 1968, elections

Panama, page 74

**"There was a huge, pent-up demand to be heard. So many people wanted to have a voice."**

John Palm Sasso
MIS director, Electoral Tribunal, Panama

# Cluster memory: 10 times faster

## DEC Memory Channel beats FDDI net speed

By Michael Goldberg

The troublesome task of networking clustered servers got a boost recently with the introduction of Digital Equipment Corp.'s Memory Channel interconnect.

The technology will be a boon for commercial data warehousing applications, according to Digital.

The hardware-based Memory Channel gives all the computers in a cluster access to a common memory system. Each of the servers connects to a Memory Channel hub through a Peripheral Component Interconnect card and can then access the memory of other servers in the cluster.

Because the Memory Channel doesn't need software that governs transactions through a computer's I/O system — and therefore slows them down — it can be 10 times faster than standard networking schemes such as Fiber Distributed Data Interface (see chart).

**Cluster luster**

Digital's Memory Channel clustering performance lands in the middle when compared with other message-passing technologies

| | Maximum messages passed per second | Bandwidth |
|---|---|---|
| Symmetrical multiprocessing bus | More than 10 million | More than 500M byte/sec. |
| Memory Channel cluster | More than 2 million | More than 100M byte/sec. |
| Network cluster | Less than 10,000 | Approximately 10M byte/sec. |

### Versions on tap

Digital is offering the technology for scientific users running Digital Unix-based AlphaServers. The company's executives also have pledged to bring the Memory Channel interconnect to commercial OpenVMS-based systems by June 1996 (CW, Dec. 11).

At the University of Rochester in Rochester, N.Y., Professor Michael Scott said his lab uses Memory Channel interconnects in a cluster of four midrange AlphaServer 2100s for simulations in physics and aerodynamics.

Memory Channel allows the lab to use midrange machines, which cost approximately $60,000, for some functions that would normally require a more expensive massively parallel system, Scott said.

"Functionally, the Memory Channel lets us do things that other networks don't," he said. One server can access memory on another without interrupting its processor, Scott added.

"Digital is using this to do very fast message passing," he explained.

Digital also plans to produce Memory Channel versions for commercial systems running Digital Unix and Windows NT, but a release date hasn't been set.

Omri Serlin, publisher of "The Serlin Report on Parallel Processing" in Los Altos, Calif., said Cray Research, Inc. and Convex Computer Corp. are using a networking scheme called Scalable Coherent Interconnect for high-end systems.

The Memory Channel is more flexible because it works with lower-cost midrange servers, he said.

Analysts said other systems vendors offer technologies that rival Digital's Memory Channel in performance but may not be as flexible.

And Terry Bennett of The Bennett Group in Portland, Ore., said Silicon Graphics, Inc. offers Asynchronous Transfer Mode to link arrays of its Challenge series servers, but its performance lags behind that of the Memory Channel.

# Oracle renews its Rdb commitment

## Version 7.0 to ship in second-quarter '96

By Michael Goldberg

Oracle Corp.'s Version 7.0 of the Rdb database is expected to give users the ability to load up to 14G bytes of data in main memory.

The new release, announced in early December, was also designed to let database administrators establish an up-to-date backup system at a remote location.

Just as important as these new features, users said, is that Oracle has demonstrated a commitment to the future of Rdb, a product that runs on Digital Equipment Corp.'s OpenVMS-based systems. Oracle purchased it from Digital a year ago.

**Anxieties eased**

Attendees at the Digital Equipment Computer Users Society (DECUS) conference in San Francisco in early December said they were anxious about Oracle's plans for Rdb after the database vendor took over the product from Digital. Rdb Version 7.0, related enhancements and Oracle's promise to move Rdb further into the open systems world eased these concerns, users said.

"Oracle has made it very clear they are very serious about the product," said Philip Kurjan, principal engineer at Consilium, Inc., a Mountain View, Calif., developer of factory management systems that work with Oracle technology.

At DECUS, Oracle officials said Rdb7, a new 64-bit version designed for large-memory systems on OpenVMS-based computers, would be ready in the second quarter of 1996 [CW, Dec. 11]. Pricing information is due in January.

Oracle officials said they are bringing new graphical user interfaces to Rdb7. They are also adding new application development tools such as Rally, a fourth-generation language, that already are available for the Oracle7 systems.

These developments, and others expected in the future, give Rdb users a technology path to follow, said Jonathan Eunice, an analyst at Illuminata in Nashua, N.H. Making Rdb available on other Digital-supported operating systems — Digital Unix and Windows NT — will help users, Eunice said.

"The Rdb people feared it would be restricted to [Digital] VMS systems, and therefore that there was no future. Digital Unix is a migration enabler," he said.

Barry Wallis, a datsbase architect at PacifiCare Health Systems in Cypress, Calif., said Rdb supports the core business systems at his health care firm. Wallis said he is considering setting up a hot standby database with Version 7.0.

Jeff Phelps, senior database administrator at Network Telephone Services, Inc. in Woodland Hills, Calif., said he enlisted as a beta site for Rdb7. He expects his firm may need large memory capabilities in future. "Everyone wants to archive data, to pull up some records from six mooths ago" for historical reports, he said.

**New features of Oracle Rdb database Release 7.0 for Digital VAX and Alpha systems**

| Feature | What it does |
|---|---|
| 64-bit addressing | Caches 14G bytes of data records in memory |
| Vertical partitioning of tables | Provides faster access to frequently used sections of a database |
| Hot standby option | Provides continuous backup at a remote location |

**Databases**

# Data centers

CONTINUED FROM PAGE 73

tem depreciation and the amount of disk storage on individual servers, Maggs said.

One big hurdle IS managers face in recovering costs for their distributed systems is a lack of usage measurement tools, which still are taking only baby steps in client/server environments.

At the Principal Financial Group in Des Moines, Iowa, for example, charges to user departments are essentially "done by hand by figuring ont our people cost," said Douglas Gumm, assistant director of technical support. "[Fees are] based on the amount of time [data center operators] work on a particular system."

The financial services firm has more than 50 Unix and network servers in its data center now and wants to move to a more mainframe-like method of charging distributed users, Gumm added. "But that's pretty difficult to achieve in the near term," he said.

Even if better client/server measurement tools become available, basing cost recovery purely on resource consumption could be tough sledding in distributed installations where pieces of applications are split between multiple servers and desktop PCs.

Bruce Stewart, a Gartner Group analyst, said data centers should steal a page from the outsourcing playbook and move to fixed-price charges for client/server systems. Metering could be done "only to see if a department falls within range" of system usage levels agreed upon in advance.

**Bitter pill**

But chargebacks derived from inflexible metrics such as data center costs or the number of users are "a recipe for disaster" because they don't provide a true indication of server usage by different departments, Stewart added. He recommended basing fees on service levels defined in user terms, such as the number of payroll checks processed in a given month.

"We have to come up with something that people [in departments] can understand and that they think is reasonable. Otherwise, you get angry users," agreed an IS official at a database marketing firm in the Midwest.

For its initial client/server forays, the company is basing chargebacks on flat allocations such as the number of client licenses tied into a server, he said. But that approach isn't comprehensive and will become even less meaningful as multiple departments begin to share servers, the official noted.

# Panama

CONTINUED FROM PAGE 73

were conducted at the usual five-year intervals, but they were far from fair, said John Palm Sasso, MIS director at Electoral Tribunal, the Panamanian government agency in charge of elections.

Violence wasn't unusual. The military leadership felt free to disregard election results, installing its preferred candidates instead of the legitimate winners.

Notorious dictator Gen. Manuel Antonio Noriega was overthrown in 1990, and the winner of the 1989 elections, Guillermo Endara, belatedly became president. One of his major goals was to make elections meaningful again.

In pursuit of that goal, Palm, in 1991, replaced a hierarchical, Digital Equipment Corp. VAX-based database management system with a client/server implementation. A Sybase, Inc. DBMS runs on two IBM RS/6000s and two AT&T Global Information Solutions' 3400s. DOS PCs replaced dumb terminals for the 150 users in the Electoral Tribunal's nine provincial offices, providing them with more computing power, Palm said.

The elections of May 8, 1994, were the largest in Panama's history. More than 25,000 candidates vied for 1,400 elected offices. "There was a huge, pent-up demand to be heard. So many people wanted to have a voice," Palm said.

**Computer add-ons**

The agency leased three additional servers and licensed Sybase's Replication Server, an add-on to the Sybase relational database management system that allows data to be copied to multiple sites nearly instantly without human intervention.

As results poured into the agency's headquarters from the country's 1,500 polling places, they were replicated to the Convention Center five miles away, where hundreds of journalists, U.N. observers, members of human-rights groups and repreSeotatives of the country's 14 political parties could analyze them in minute detail. Working from 125 DOS PCs, those users could view results for any given candidate, province or even polling place.

The system worked.

Within 24 hours after the polls closed, the results were 99% complete, and the usually contentious parties agreed the results were fair and accurate.

The official recount found an error rate of only 0.013%. The system wouldn't allow polling places to be deleted without an elaborate protocol being followed, as protection against tampering that could influence the outcome.

"The elections were free and fair, very different than in the past 20 years," said Ramon Obon, a sales representative for American Airlines who lives in Panama City.

So successful was the system that no change is planned for the next elections, in 1999, Palm said.

## Briefs

**Digital is target of European probe**

Digital Equipment Corp. offices in Great Britain, Germany and the Netherlands recently were raided by European Commission officials investigating complaints of anticompetitive practices against the Maynard, Mass.-based company. The complaints charge that Digital used its dominant position in hardware sales to gain an unfair advantage in winning software maintenance deals. Digital said its practices were in compliance with European Union antitrust rules.

**Israeli HMO picks AS/400**

Maccabi, a health maintenance organization in Israel, bought 60 IBM AS/400 midrange systems to run a client/server medical history application. The AS/400 beat out Unix systems from Digital and Data General Corp. to win the order. The systems will allow Meuhedet doctors to examine medical records, order laboratory tests and perform other tasks from PCs connected to the IBM machines.

**SAS will expand consulting staff**

SAS Institute, Inc. in Cary, N.C., has announced plans to double its U.S. consulting staff by the end of 1996 to 140 employees if demand for consulting services continues to meet the company's expectations.

DEVELOPERS TARGET WORLD WIDE WEB, 76
NEW PRODUCTS, 76

# Application Development





# Friendly C++

## New tools make it easier to understand complex code

By Frank Hayes

C++ has a pretty unfriendly reputation among corporate developers. It is a write-only language, they complain; its code can be cryptic and almost impossible to understand by anyone except the programmer who wrote it. That presents a major problem for corporate information systems shops, where code will have to be maintained by many developers in its lifetime.

But the tools for making sense of C++ code are improving. Hewlett-Packard Co. early next year will ship SoftBench 5.0, a new version of its C++ development environment that focuses on making code easier to understand.

### Decomposing code

"For a while we've needed tools that will decompose C++ code and let you better understand it," said Vern Badham, a senior staff scientist at Science Applications International Corp. in San Diego.

Badham spends a lot of time maintaining other programmers' C++ code. He said that task can be "very difficult if you don't have good tools that let you browse through the code to understand what it did before."

SoftBench 5.0 sports improved configuration management for C++ development. It will ship in January for HP-UX, with prices starting at $2,395, and in February for SunSoft, Inc.'s Solaris, with prices starting at $1,895.

The improvements should help developers create cleaner, more consistent code from the beginning, said Dave Groening, a senior engineer at Alcatel Network Systems, Inc. in Raleigh, N.C. Groening has been briefed on SoftBench 5.0.

The product's code style checker is based on a set of rules that comes with the development system, but "you can also add your own rules and modify the ones that are there," Groening said.

### Better than ever

An improved class editor simplifies the task of specifying how one C++ class inherits characteristics from another. Developers can use a mouse to make or break connections between classes, and the tool set automatically will generate or modify the underlying code.

But just as important are SoftBench 5.0's tools for understanding existing C++ code, Badham said. He also has been briefed on the product.

"The new editors have all kinds of color coding, and you can do things like make a change in one class and have it propagated throughout the entire code," he said. "These are the kinds of things we've been screaming for out in the industry for a long time."

### Why is C++ so hard?

Traditional IS languages such as Cobol were designed to make code easy to understand. For example, Cobol allows only one operation per program line and encourages long, descriptive variable names. But C++ variable names traditionally are terse because some early compilers allowed only short names. And like its predecessor C, C++ lets programmers write extremely complex code that can include many operations in a single line — a feature that can encourage code that is complex and almost impossible to understand.

Mitch Betts

# Preference vs. performance

Users say they like a colorful interface, with realistic three-dimensional graphics and icons galore for point-and-click action. So, of course, we give it to them.

If we've learned nothing else in this age of total quality management, user-centered design, rapid prototyping and customer service, we've learned that the customer is always right. We trot out a few prototypes of graphical user interfaces and ask users, "Well, which one do you like best?"

But the customer isn't always right. A wide body of research shows that the computer interfaces users prefer sometimes make them perform worse.

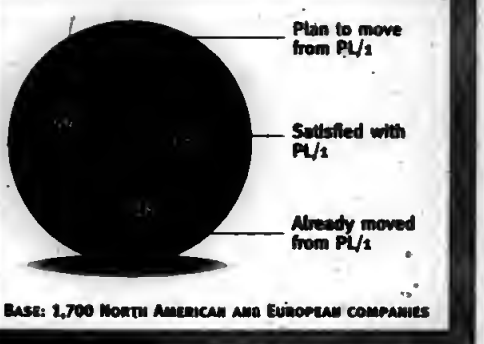
This is heresy, I know. The user is king! Surely users would know if the interface actually slows them down or leads to more errors.

In fact, we humans aren't very good judges of our performance. The usability literature is full of counterintuitive studies demonstrating — as Robert W. Bailey, president of Computer Psychology, Inc. in Salt Lake City, put it — that "users can perform well and not like a system, or like a system and still not perform well."

For example, a 1990 study compared five

**Preference vs. performance,** *page 76*

Snapshot




BASE: 1,700 NORTH AMERICAN AND EUROPEAN COMPANIES

Briefs

### LBMS announces Windows client/server modeling tool

LBMS, Inc. in Houston has announced Systems Engineer 6.1, a new version of its Windows-based client/server modeling tool set. Version 6.1 works with databases from Informix Corp., Oracle Corp., Sybase, Inc., Microsoft Corp. and IBM. Systems Engineer 6.1 was scheduled to ship at the end of December. It costs $5,000.

### Object Power offers free beta version of Openscape

Taking a page from Netscape Communications Corp.'s book, Object Power, Inc. in Cambridge, Mass., recently announced a free beta version of its Openscape security system. Openscape 1.0 lets developers build applications that communicate using the government's Data Encryption Standard. The beta can be downloaded from Object Power's World Wide Web site at http://www.opower.com. A commercial release will ship in January at a cost of $145 for a personal version and $10,000 for an enterprise edition.

### NetManage ships software development kit

NetManage, Inc. in Cupertino, Calif., began shipping a software development kit for building Windows-based internal Internet applications. The NEWT-SDK 5.0 tool kit was designed for use with C, C++ and Microsoft's Visual Basic. The kit includes Dynamic Link Libraries that support Simple Mail Transfer Protocol, file transfer protocol and terminal emulation. The kit also supports Visual Basic controls and OLE controls. NEWT-SDK 5.0 lets developers deploy applications internally with no added royalties. It costs $500.

# Developers focusing more on Web apps

By Frank Hayes

Is the World Wide Web ready for full-scale applications?

Ready or not, application development tool vendors are beginning to focus on the Internet. A new wave of development tools has been designed to let developers create applications that use a Web browser as a user interface.

Users can access applications through the browser, rather than have to log in through a remote access program.

That can't happen too soon for some corporate developers who want to use the Web for internal and external applications.

"We have information kiosks so the public can obtain property tax, recycling and other information," said Greg Stoddard, systems manager for the distributed processing team at the Riverside County General Services Agency in Riverside, Calif. "We want to do [those applications] with Web pages, too."

**Same info everywhere**

The same information should be available to users whether they are looking at a Web page, desktop computer or public information kiosk, Stoddard said. And the information should be available from the same program so that developers don't have to rewrite applications two or three times, he said.

Development tool vendors are beginning to respond. Some companies, including Microsoft Corp., have developed long-term plans to support the Internet with their tools.

Texas Instruments, Inc. in Plano, Texas, last week said it plans to add Internet support to its Composer development system, which can be used to create client/server applications for everything from mainframes to PCs. And Powersoft Corp. in Concord, Mass., earlier this month said future versions of PowerBuilder will support Java, the Internet scripting language from Sun Microsystems, Inc.

Other vendors are moving more quickly. Symantec Corp. in Cupertino, Calif., and ParcPlace-Digitalk, Inc. in Sunnyvale, Calif., are shipping Web-enabled versions of their development tools.

Neuron Data, Inc. in March will begin shipping a Web-oriented addition to its Smart Elements development system. Web Element will let developers use Neuron Data's ObjectScript language to build Web pages and applications that can access the Web. Web Element will cost about $45 per user with a 500-user deployment license, according to officials at the Mountain View, Calif., company.

Developers don't need major retraining to create Web-oriented extensions because they already know how to use the existing tools, said Tom Thornbury, lead architect for the electronic commerce group at Dun & Bradstreet Information Services in Parsippany, N.J.

But development environments also let developers dodge some of the complexities of building applications that use the Web as an interface. "You have to provide some kind of session capability so the application can keep track of multiple users," Thornbury said.

A development environment provides that automatically; a developer using a scripting language such as Sun and Netscape Communications Corp.'s Java Script or Microsoft's VB Script must build that capability by hand, he said.

**A developing situation**

| | |
|---|---|
| Microsoft | Developing VB Script, an Internet-enabled version of Visual Basic |
| [redacted] | |
| Borland | Developing Latte, a visual development system for Java |
| [redacted] | |
| Neuron Data | Developing Web Element, an Internet extension to Smart Elements development system |
| [redacted] | |
| ParcPlace-Digitalk | Will ship VisualWave, a Web-enabled Smalltalk development system, by year's end |

# Preference vs. performance

CONTINUED FROM PAGE 75

computer system prototypes, each with a different interface. The interface that produced the best user performance showed the worst preference ratings. Likewise, the one that produced the worst user performance had the best preference ratings.

Several studies also have shown that the highly popular 3-D graphics used to adorn two-dimensional data — such as the cartoonish 3-D bar and line graphs seen in *USA Today* — actually slow users down, distract them from the important information and lead to errors.

This "performance/preference dissociation" is spelled out in the October issue of a scholarly little magazine called *Ergonomics in Design*, published by the Human Factors and Ergonomics Society in Santa Monica, Calif. (72133.1474@compuserve.com). The article, "When Users Want What's *Not* Best for Them," was written by human factors specialists Anthony D. Andre and Christopher D. Wickens.

So, does this mean we reverse course and ignore users' likes and dislikes? No, but it means we need to include performance measures such as speed and accuracy during application development and postimplementation studies. And if the system is safety-critical, accuracy should be given top priority.

Measuring the speed and accuracy of the user's work is more complicated than just shoving a questionnaire under his nose. But, after all, enhancing user productivity is the main reason we build information systems.

The best approach may be to tell users which interface really has better performance characteristics. This may start the process of changing users' preferences. In the end, we want to optimize user performance and satisfaction.

Betts is *Computerworld*'s senior editor of social and legal news.

[redacted]

**Caliper Corp.** has introduced Geographic Information Systems Developer's Kit, an extension to Caliper's Mapitude software.

According to the Newton, Mass., company, the kit features mapping and analysis functions, street and ZIP code information, counties and metro-area information and demographic statistics for custom-mapping application development.

The kit lets developers create custom applications with menus and dialog boxes tailored to specific vertical applications. It also can help create server applications, which lets developers add OLE-embedded maps and spatial analysis capabilities to their own programs.

Developers can use most programming languages to construct the client application, including Microsoft Corp.'s Visual Basic, C and C++ or another application's macro language.

Geographic Information Systems Developer's Kit costs $395.

▶ *Caliper*
*(617) 527-4700*

**Voice Processing Corp.** has announced VProFlex/XD.

According to the Cambridge, Mass., company, VProFlex/XD is speech-recognition technology that helps developers create flexible, accurate vocabulary for speech applications. It uses phoneme-based technology to create speech-recognition vocabularies without collecting speech samples.

Users can order vocabularies and choose from a set of more than 1,000 words and phrases. VProFlex/XD vocabularies can be mixed with Voice Processing's VPro/XD vocabularies in the same application and on the same hardware.

A VProFlex/XD vocabulary costs $1,000 for unlimited use. It ships with performance data.

▶ *Voice Processing*
*(617) 494-0100*

**Interactive Software Engineering, Inc.** has introduced EiffelMath, a library of reusable, object-oriented components.

According to the Santa Barbara, Calif., company, EiffelMath is a library of components for numerical computation in finance, banking and scientific applications. It applies object-oriented concepts to help users program numerically intensive computations in areas such as probability, statistics, numerical integration, linear and nonlinear equations, ordinary differential equations, fitting and interpolation, optimization and timer series analysis.

EiffelMath was designed to relieve numerical application developers from the task of memory management, which is usually handled with solutions directly based on Cobol, Fortran, C or C++.

Pricing for EiffelMath starts at $995.

▶ *Interactive Software Engineering*
*(805) 685-1006*

**ACI US, Inc.** has announced its 4th Dimension Software Development Kit.

4th Dimension is a 32-bit, cross-platform relational database with a graphical interface and programming language.

The Cupertino, Calif., company said 4th Dimension Software Development Kit is a comprehensive development package for building, compiling and distributing 4th Dimension applications.

It gives developers an environment in which to create custom four-dimensional applications. The kit bundles ACI's 4th Dimension, 4D Compiler Pro, 4D Insider and an unlimited runtime distribution license.

The Windows version of the kit runs on a 386-, 486-, or Pentium-based PC with a hard disk drive, Windows 3.1 or later and at least 8M bytes of RAM. It also runs on Windows 95 with 8M bytes of RAM and Windows NT Workstation or NT Server with at least 16M bytes of RAM. The Macintosh version requires a Macintosh with a hard disk drive, System 6.0.7 or later and at least 2M bytes of RAM.

4th Dimension Software Development Kit costs $2,995.

▶ *ACI US*
*(408) 252-4444*

# Jobs Survey: Outlook '96

**For IS job seekers, the 1996 market is absolutely on fire. In every industry and region, and at every career level, the corporate cry will be . . .**

# HELP WANTED!

BY KATHLEEN MELYMUKA

## Perfect for the job

With her impressive resume, Betty Bitzenbytes knows she can write her own ticket to gainful employment as an information services professional. In fact, based on results from a recent *Computerworld* survey of 225 IS managers nationwide, Betty is just about the perfect composite job candidate. She lives in the hottest area of the country for IS hiring. She has worked with businesspeople and IS staff, demonstrating the "soft skills" that are crucial in today's IS market. And Betty has skills in networking and on both sides of client/server, the hottest platform in the industry. She also has experience with the industry's "next big thing," the Internet.

Betty has earned a business degree, which puts her a step above candidates with just a bachelor's degree. She has four years of increasingly responsible experience at a midsize company, and she is applying for jobs at companies of similar size and type. (Small-to-midsize companies are doing most of the hiring, and most employers say experience in the same type of business is important).

Betty is just sitting back and watching the job offers pour in.

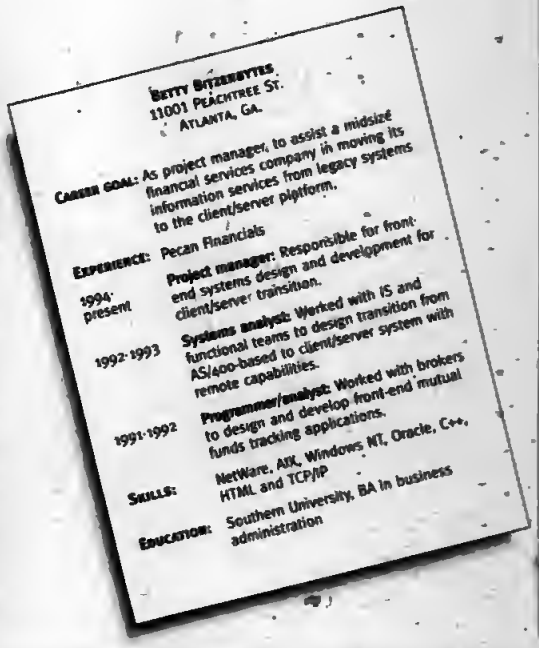
If you don't fit the mold as perfectly as Betty, don't worry. The IS hiring picture for 1996 is so good, you'll find opportunities in every nook and cranny of the industry.

"We're hiring like crazy," says Karin Wacaser, a spokeswoman at Sabre Decision Technologies, the IS development arm of American Airlines, Inc. in Fort Worth, Texas. "We have 400 positions open worldwide, and we're expecting our growth to continue in 1996."

IS executives and recruiters across the country say the hiring outlook is very favorable.

"The market has been absolutely on fire," says Greg McConnell, a senior consultant at Winter, Wyman & Co., a recruiting firm in Boston. "There are actually three markets right now: There are the older mainframe and midrange markets. People have made huge investments in those, and they want to keep them up and running. The whole client/server market — the PC-based Unix server environment — is exploding. And the big-

**Help wanted,** *page 79*



BETTY BITZENBYTES
11001 PEACHTREE ST.
ATLANTA, GA.

**CAREER GOAL:** As project manager, to assist a midsize financial services company in moving its information services from legacy systems to the client/server platform.

**EXPERIENCE:** Pecan Financials

1994-present — **Project manager:** Responsible for front-end systems design and development for client/server transition.

1992-1993 — **Systems analyst:** Worked with IS and functional teams to design transition from AS/400-based to client/server system with remote capabilities.

1991-1992 — **Programmer/analyst:** Worked with brokers to design and develop front-end mutual funds tracking applications.

**SKILLS:** NetWare, AIX, Windows NT, Oracle, C++, HTML and TCP/IP

**EDUCATION:** Southern University, BA in business administration

# Information Technology @ Intel. When can you start?

Not many companies can offer you the opportunity to apply next generation IT technology to an enterprise that spans the globe with thousands of users. But Intel is an unusual kind of company.

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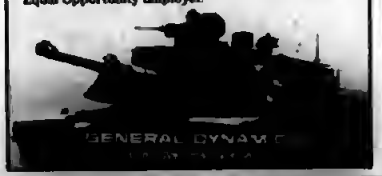


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CONTINUED FROM PAGE 77

gest trend of all is networking. The networking boom probably is going to bring us into the next century. It's huge."

The fast pace of technological change is the major factor driving hiring demand. The need for client/server and object-oriented development skills is providing vast pools of opportunity virtually everywhere. Growth in industries such as manufacturing, health care and services also is boosting employment. In the Great Lakes region and the Mississippi Valley states, for example, ups and downs in manufacturing are reflected in hiring activity.

Whirlpool Corp. in Benton Harbor, Mich., is experiencing heavy recruitment in telecommunications and networking because of changing technology and its expansion to global markets.

"Networking, telecommunication and linking of [the two] are the technical skills we are looking for more and more," says Pascal Desbourdes, human resources manager at Whirlpool. "By net-

Help wanted, page 80

For more survey results, see charts, page 80

## TOP TOOLS OF THE TRADE

Networking and systems operations top the most-sought IS skills

| | New England | Mid Atlantic | East North Central | West North Central | South Atlantic | East South Central | West South Central | Mountain | Pacific | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Development tools | Network operating systems | Operating systems | Operating systems | Operating Systems | Networking | Network operating systems | Operating Systems | Applications | Network operating systems |
| 2 | Network operating systems | Applications | Network operating systems | (tied responses) Languages | (tied responses) Network operating systems | Network operating systems | Operating systems | (tied responses) Network operating systems | (tied responses) Network operating systems | Operating systems |
| 3 | Networking | (tied responses) Operating systems | RDBMS | Network operating systems | RDBMS | (tied responses) Operating systems | (tied responses) Languages | RDBMS | RDBMS | (tied responses) RDBMS |
| 4 | (tied responses) Operating systems | RDBMS | Development Tools | Networking | Networking | RDBMS | Development tools | RDBMS | Operating systems | Networking |
| 5 | RDBMS | Networking | Languages | Development tools | Applications | Applications | Applications | Languages | Networking | Languages |

Source: Survey of 225 IS executives and recruiters, with 25 from each region

## THE RIGHT PERSON FOR THE JOB

Job titles ranked as most in-demand by region:

| | New England | Mid Atlantic | East North Central | West North Central | South Atlantic | East South Central | West South Central | Mountain | Pacific | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Networking | Networking | Systems development | Top IS management | Networking | Networking | Systems development | Networking | Systems development | Networking |
| 2 | Systems development | PC support | Networking | (Tied response) Systems development | Systems development | Tech services operations | (Tied response) Networking | Systems development | Networking | Systems development |
| 3 | Top IS management | (Tied response) Systems development | PC support | Tech services operations | PC support | Systems development | PC support | Top IS management | Top IS management | Top IS management |
| 4 | PC support | Tech services operations | (No response) | Networking | Top IS management | PC support | (Tied response) Top IS management | Tech services operations | (Tied response) PC support | PC support |
| 5 | Tech services operations | Top IS manage- | (No response) | PC support | Tech services operations | Top IS management | Tech services operations | PC support | Tech services operations | Tech services operations |

Source: Survey of 225 IS executives and recruiters, with 25 from each region

## WHAT THE FUSS IS ALL ABOUT

THE TOP FACTORS DRIVING THE IS HIRING DEMAND WILL BE:

**48%** TECHNOLOGY TRENDS

**36%** INDUSTRY GROWTH

**35%** GENERAL ECONOMIC CONDITIONS

**22%** INDUSTRY RESTRUCTURING

**22%** OTHER FACTORS

Source: Survey of 225 IS executives and recruiters, with 25 from each region

# HELP WANTED!

CONTINUED FROM PAGE 79

working, I mean local-area and now, even more important, wide-area network computing.

"One reason for this is information systems-related: The technology is moving that way," Desbourdes says. "The other is business-related: Whirlpool, every day, is more and more a global company. The investment we're making in information systems has to be consistent with worldwide communication."

## Sensational support

Igor Tooplease is finding that growth in the New England health care market has pushed his resume to the top of the pile.

**IGOR TOOPLEASE**
1001 COMMONWEALTH AVE.
BOSTON, MASS.

**CAREER GOAL:** As help desk manager, to supervise the design, development and maintenance of centralized help desk functions for a decentralized community health care organization.

**EXPERIENCE:**
1993-present: Techside Hospital — Help desk operator
1992: LAN manager

**SKILLS:** NetWare, TCP/IP, Oracle

He is a custom-fit for potential employers such as Beth Israel Hospital in Boston, where community outreach programs depend heavily on centralized help desk functions.

Igor has help desk experience and experience in the most sought-after networking, communications and database environments. And although his experience is limited to three years, it is specific to the health care industry.

"We need people with experience with help desk and network support services," says Audrey Feinberg, a human resources representative at Beth Israel.

"We're moving from older systems into new. We're looking for people experienced in conversions from one type of database to another," she says. "We're also expanding into the community with new centers in two suburban towns, and we're [pairing up] with physician practices in the community. We need to develop centralized databases accessible to all of those," Feinberg says.

### Evolving skills

Just as Beth Israel is migrating from older systems to new ones, there is a skills evolution emerging — from established technologies such as Novell, Inc.'s NetWare and Unix operating systems to upstarts such as Microsoft Corp.'s Windows NT, the World Wide Web and object-oriented tool sets. The net result is a wider job market.

"Novell skills was a huge market for us this year, and it's still very hot," McConnell says. "But the trend we're seeing is a push toward NT, and we're gearing up for a big call for NT in '96," he says.

"[We still need] NetWare folks, but less so," says Larry Lundin, technical recruiter at Levi Strauss & Co. in San Francisco. He says Levi Strauss is moving away from Novell's networking system and leaning toward Windows NT. "Someone who knows both would be a good candidate and [eventually] would be working strictly in NT," Lundin says.

The Unix world may be experiencing a similar, very gradual erosion. "Windows NT is getting stronger. In many places it's replacing Unix," says Bud Thompson, president of Computech Software Services, Inc., a New York firm that recruits IS professionals for custom development projects.

But there still are plenty of opportunities for Unixphiles. For example, "people who know the Unix world" are high on the recruitment list at FedEx Corp. in Colorado Springs, says John Hoffman, senior technical specialist at the firm. And Unix also is the most wanted operating system skill at Sabre.

## Remote control

Norman Net knows he will get a warm welcome at KFC National Purchasing Cooperative, Inc. in Louisville, Ky., where the networking focus is on the big picture. Norman's experience in wide-area and remote computing puts him on the cutting edge — just where KFC wants to be.

**NORMAN NET**
101 DERBY DRIVE
LEXINGTON, KY

**CAREER GOAL:** As project manager, to design and implement a remote computing system in a widely decentralized food service company.

**EXPERIENCE:**
1993-present: Free Lunch Food Chain Corp. — Project manager for remote sales/fulfillment project.

**SKILLS:** NetWare, TCP/IP, ATM, World Wide Web

"We still don't have enough expertise in [wide-area networking] and remote computing," says Tim Vogel, manager of field systems at the restaurant chain. "More and more end users aren't hooked up to a LAN but have the same need for information. We're trying to come up with remote computing solutions. If an individual had successfully implemented remote computing solutions for a significant number of people, we would bend over backward to get that person."

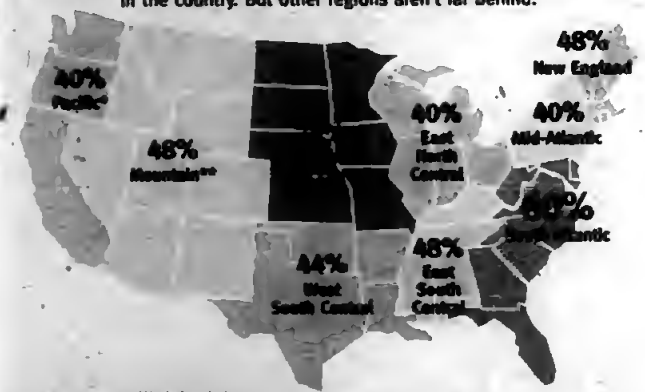
### Logical next step

KFC isn't the only potential employer seeking to hire people with expertise in remote computing. Companies are becoming increasingly dependent on mobile sales forces and off-site workers, so remote computing is the next logical step in networking.

"Our clients have an eye on developing applications that have some component of communication," says Dan Miller, president of MTS Boston Information Services, Inc., an IS recruiting firm in Boston.

## HOT CLIMATES

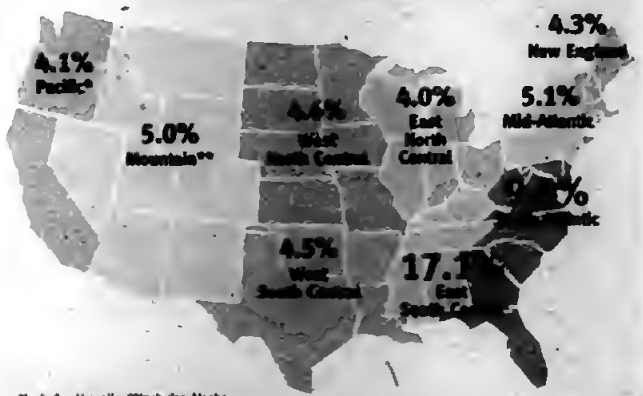
Six out of 10 survey respondents in the South Atlantic states plan to increase their hiring in 1996, making it the most lucrative recruiting area in the country. But other regions aren't far behind.




*Includes Hawaii **Includes Alaska
Source: Survey of 225 IS executives and recruiters, with 25 from each region

## SOUTHERN HOSPITALITY

Starting salaries for IS professionals will increase the most in the Southern states, dramatically outpacing all other regions




*Includes Hawaii **Includes Alaska
Source: Survey of 225 IS executives and recruiters, with 25 from each region

"There's a real push throughout the development industry to create products that can be transmitted," Miller says. "The whole concept of sharing work: the virtual company, the virtual office, workers in different places sharing ideas and concepts via the Internet. That's a very strong push. They're looking for development skills and experience in those areas."

The need to share information on the network also puts an increasing focus on groupware.

"There's a huge market for groupware [skills], especially Lotus Notes, and we expect growth there," McConnell says. "We're keeping an eye out for Microsoft Exchange, too. It's relatively new and not as robust as Notes, but looking at Microsoft's market share, we have to expect them to be a player," he says.

At Levi Strauss, networking means tying newer client/server systems to older mainframes. "A lot of companies such as Levi have mainframe technology that they're trying to get away from and go to client/server, but it's real hard to just dump it and go," Lundin says.

"So middleware is probably going to be big at Levi: systems and software that will tie together client/server-type technology and mainframe-type technology," he says.

FedEx is taking things further; its new client/server systems are beginning to usurp the mainframes. "Here in Colorado Springs we're setting up a new data center that will be entirely client/server. So there will be opportunities for people who know client/server hardware and C++ programmers," Hoffman says.

"On the application development side, what has been and continues to be strong is Visual Basic and C++," Thompson says.

"On the client/server side, our clients are asking for people with skills in rapid application development tools," McConnell says. That includes experience with Powersoft Corp.'s PowerBuilder, Microsoft's Visual Basic andVisual C++.

"Those [skills sets] are very, very hot in the market now," McConnell says.

**ONA OBJECT**
1001 INHERITANCE LANE
ANYTOWN, USA

**CAREER GOAL:** As systems programmer, to apply state-of-the-art object-oriented development skills in developing applications for a large, international company. Will travel.

**EXPERIENCE:**

1993-present Systems programmer

1992-1993 Programmer/analyst

**SKILLS:** Visual Basic, PowerBuilder, Object Cabol, C++, Smalltalk

## Development dream

Ona Object's single-minded focus on state-of-the-art development makes her a top candidate for a company such as Sabre.

"We're focusing on object-oriented development and programming an we're looking for people skilled in C++, Visual Basic and Smalltalk," Wacaser says.

KFC, too, might make Ona an offer. "We're looking for individuals who understand how to develop in an [object-oriented] language that builds on reusability of code and encapsulation," Vogel says. "[We're looking for individuals who] understand how ancestors and inheritance hierarchy works. The specific applications they would be developing would be in C++ and PowerBuilder."

Ona can choose from among eager employers because object-oriented development skills are at a premium. Companies can't train object-oriented programmers fast enough, so Ona would be welcomed virtually everywhere. She may even be wooed away from her new job by a more ardent employer.

All this concentration on state-of-the-art technology doesn't mean that the mainframe is dead, however. Far from it. "DB2 and Informix are the two [database management systems] we use extensively. We have to keep those skills finely honed," Vogel says. "If a person were extremely strong in that area, along with other skills, he or she would be a better candidate for us."

DB2's popularity backs up recruiters' claims that mainframe database skills still are in demand. "The mainframe is very hot, at least in the New York financial services industry," Thompson says. "People have so much data that a lot of them are enhancing their mainframe systems using CICS or DB2. They're using DB2 as the server from the mainframe down to the workstation."

### Icing on the cake

IS skills are in demand throughout the country, and thousands of jobs are waiting to be filled. Prospective employers stress, however, that there is more to most IS jobs than just technical skills.

"There's a set of core competencies we look for in individuals coming to us for employment, and they don't necessarily have to do with the latest and greatest tool," Vogel says.

"From a technical perspective, they revolve around knowledge of data and how it works and how it's associated," Vogel says. But they also relate to working with non-IS people in the real world, he says.

"We're looking for people who are able to work with end users to design an interface that works for the end users and is manageable, programmable and doable from the technical perspective," Vogel explains.

You could say technical skills are the icing and core competencies, the cake. Put them together in 1996 and it's party time. ■

Melymuka is a freelance writer in Duxbury, Mass.

## SOFT SKILL PROFICIENCY

**Technical skills aren't enough; top IS candidates also must have people and business skills**

The need for various technical skills is well-established. But many companies are adamant about the need for their information systems staff also to have more subjective skills.

"Even from a technical perspective, today's environment doesn't allow us the luxury of having the classic programmer who goes heads down," says Tim Vogel, manager of field systems at KFC in Louisville, Ky. "Developers have to interact with end users. Soft skills are exactly what we need."

KFC is looking for "two types of people," according to Neal Bronzo, director of information services at the company. "Some really want to be pure technical people. They want to find a niche and be the best in that niche. We need people like that. If all our [applications] are built on DB2, we need somebody who eats, breathes and sleeps it," he says.

"The second type of person has a focus also on the business, the ability to understand why we're doing things so they can participate in the design phase," Bronzo says. "We're trying to get away from the order-taker philosophy where we pick up orders and clients take a number and we get back to them in three months."

"Priorities need to be set based on the business impact and also on the effort required, and the client has no concept of effort," Bronzo says. "So setting priorities is a combined effort of clients and [information technology]. If our developers understand the business, they can help to set priorities. If they don't understand the business, they can't."

At Whirlpool this business focus is called the "process partner focus," and it's regarded as crucial. "It goes back to the ability of the information systems community to work closely with, and be part of, key business processes. [The IS community must] understand the business needs within the corporation," says Pascal Desbourdes, human resources manager for Whirlpool in Benton Harbor, Mich.

"Here you're speaking of consulting skills, financial skills and, of course, project management skills — of more exposure to business. [Also], the ability to understand the impact of this specific project, the ability to prioritize," Desbourdes says. "They need a heavy technical background to do that so that they will not overpromise but will understand what kind of commitment they're speaking about."

"These people need the ability to speak the business language and translate that to what will be manageable and can be put under an IS project and executed," Desbourdes says.

— *Kathleen Melymuka*

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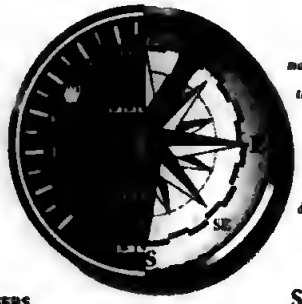

### Electrical Engineers, Chipset Development

In these positions, you will participate in the specification, evaluation, development and qualification of 586- and 686-class chipsets from the top chipset vendors. A minimum of 5 years of experience in advanced computer architecture and/or ASIC development, board layout, hardware design, test and debug, as well as Assembly and C/C++ development languages are sought. Excellent communication and interface skills are very important.
Dept. AKOP-CW-0101-EEC

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Assist Product and Operations Program Managers in ensuring products released to manufacturing are capable of delivering the level of quality expected by our customers. You will define and implement test methodologies which will be adopted throughout the organization, identify root causes of error zones and ensure timely feedback to development teams. These positions require at least 5 years in manufacturing, design, test or other product support roles where leadership/facilitation skills were used to coordinate diverse organizations. Working knowledge of conventional quality tools is a plus. Dept. AKOP-CW-0101-QPM

### Hardware Engineers

The successful candidates will contribute to the definition and development of next generation, high performance, microprocessor-based products. Additionally, you will maintain technical interface with the vendor, review schedules, develop test platforms and suites, debug initial and intermediate designs, as well as provide single point of contact for technical questions. A PC development background and excellent board level digital design and debug skills are sought. Dept. AKOP-CW-0101-HE

### Software Engineers, DSP

You will develop audio algorithms for a new DSP architecture. These positions require an advanced technical degree (MSEE preferred) with 3+ years of experience in a digital signal processing area. Familiarity with audio algorithms such as MPEG audio, Dolby AC-1 and FM synthesis is sought. Experience with PC architectures is a definite plus.
Dept. AKOP-CW-0101-SED

### Software Engineers, Multimedia

In these positions, you will write device drivers for new Windows 95 multimedia APIs. We require 3+ years of experience in a software development environments using C or C++ development and X86 Assembly languages in Microsoft Windows development environments. Experience with Windows APIs, 3D graphics, MPEG video or PC audio is a definite plus.
Dept. AKOP-CW-0101-SEM

### Systems Engineers, Software Development

The successful candidates will participate in the design, development, maintenance and support of new device configuration and setup utilities for our high-end, desktop product line. You will also interface with other software/firmware/hardware development and test organizations to define program requirements, resolve technical issues and ensure that high quality products are delivered within aggressive time constraints. These positions require proficiency in 80X86 Assembly and C++ languages with a working knowledge of MS-DOS/PC architectures. Windows and OS/2 architecture knowledge is a plus. Dept. AKOP-CW-0101-SESD

### Systems Engineers, Software Test

You will participate in the development of the overall test strategies, schedules, and plans ensuring technical completeness and effectiveness of graphics/multimedia software deliverables. Additionally, you will develop driver test applications and tools as needed and interface with other groups within and outside the graphics/multimedia function on evolving technology, project specifics and status. These positions require at least 4 years of experience in a microcomputer software test environment. Familiarity with Windows display drivers, virtual drivers and applications is highly desirable, as is OS/2, Windows NT and C language development.
Dept. AKOP-CW-0101-SEST

### Electrical Engineer

You will provide board level signal integrity analysis services for our product development teams, as well as develop and support electrical CAE tools. The successful candidate will have a BSEE, in addition to experience with board level signal integrity analysis and UNIX® and good communication, organization and interpersonal skills. Experience with C/UNIX programming and CAE tools like SPICE and QUAD/XTK is desired. Dept. JMLP-CW-0101-EE

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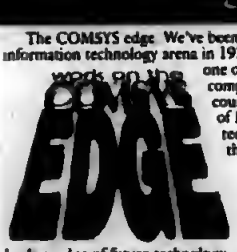


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You will be responsible for developing and implementing CIM strategies and projects in conjunction with our Manufacturing Engineering and Quality departments, as well as our manufacturing facilities. Candidates must have a Bachelor's degree in Engineering, Computer Science or related field, and a minimum of 5-8 years demonstrated experience in project management and installation of CIM systems for manufacturing. Knowledge of C, C++, Visual BASIC or related software packages also required.

### Project Manager

As Project Manager you will manage projects, supervise analysts and perform systems design/development and programming on a variety of manufacturing systems. Your first assignment will be managing a conversion project. We require Bachelor's degree in MIS or related field and no less than 5-7 years solid experience, including 2+ years large scale project management and staff supervision. Experience with DEC/VAX and C in an applications environment strongly preferred.

### Systems Analysts

You will perform systems design/development, programming, support and user training on manufacturing systems, customer and financial systems, including order entry and invoicing. Candidates must have a Bachelor's degree in MIS or related field and a minimum of 2 years of design/programming experience. Experience with DEC/VAX and C or COBOL required. EDI, FOCUS and MRP experience helpful.

All positions require 25% travel. In return for your expertise, we offer competitive salaries, excellent benefits, and all the amenities of life in Menomonee, WI, a vibrant community that combines the best of family and cosmopolitan lifestyles including affordable housing, excellent schools, and 4-season recreation opportunities. Our dress code is casual and our environment encourages you to work to the highest level of your capabilities. Qualified candidates are encouraged to send resume with salary history to: Human Resources (X-69), ATTN: DS, Johnson Controls Battery Group, Inc., 5757 North Green Bay Avenue, P.O. Box 591, Milwaukee, WI 53201-0591, (FAX (414) 228-2282, E-mail: humanresources.battery@jci.com) Due to the high volume of resumes we receive, we will only respond to those applicants who most closely fit our needs. EOE

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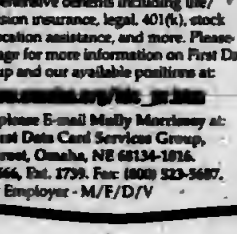

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Systems Analyst/Administrator to analyze information systems & strategic planning of information technology implementation; system analysis, documentation, information system design & cost effectiveness analyses; analyzes & documents Progress/Unix computer system, modify & enhance current computer system by reengineering software, design & program, data acquisition & Progress SQL/Unix report writing client/server front end application development under FoxPro/Windows, TCP/IP & FoxPro SQL design & implement Novell Network & Remote Communication Systems, Communication Server Application Server, Communication Equipment, design & implement E-Mail system & utilize Internet services; engineer in-house Desktop Publishing System & code PageMaker scripts; SCO Unix administration; Novell Netware administration, design WAN & user support; Reqs Bach. in Comp. Sci., Computer Electrical or Electronic Engg. systems Analyses, Comp. Info. Systems, Engg., Math or equiv. in ed. & exp. 2 yrs exp in job offered or 2 yrs related exp such as Progr Analyst, Systems Engr., or Computer Specialist. Will accept 3 yrs college ed. plus 3 yrs exp in job offered or related occup in lieu of req'd ed. & exp. Must have some related exp in designing & programming custom application using Progress & FoxPro programming, Unix system administration, TCP/IP protocols, Novell Network, SQL & Remote Communication Systems. $50,000/yr. 40 hrs/wk 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #184395

Programmer/Analyst. Will design, develop, modify, maintain, and implement software in conjunction with SYBASE and INFORMIX-4GL relational databases which is used for clinical medical applications, including establishment of clinical knowledge databases. Will maintain and develop hospital information system by developing appropriate building tools on a SMS INVISION including creation of appropriate modules including establishment of a Physician Order Entry information system. Will implement and develop appropriate formats to migrate an INFORMIX characterbased Database system to SYBASE GUI-based clinical system. Will work with Senior Programmer/Analysts to support Medical Affair and Tumor Registry Applications. Requires Master's degree in Management Information System or Information Resource Management. Education to include completion of a Master's Thesis in four months internship in which the individual modified and developed a SMS software system, in conjunction with SYBASE and INFORMIX-4GL relational databases, including use of SMS INVISION system to create modules for informational purposes. 8:00 a.m. - 5:00 p.m. 40 hours. Salary at $37,500 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send two copies of resume to: Illinois Department of Employment Security, 401 S. State St. - 3 South, Chicago, IL 60605. ATTN: James Gregory. Ref. #V-4, 13627-Z. No Calls. An Employer Paid Ad.

Programmer Analyst (2 openings) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to client needs; analyze, design, develop & implement computer software for clients EDP systems; analyze, design & develop Online Reporting System including process flow & data flow design, data modeling identification, technical support & overall design of application part of the system using IBM 3090 running MVS O.S. IBM/PCs, SQL/DS, DB2, COBOL, FOCUS, APPLICATION SOFTWARE, CICS, REXX, PC/REXX & VISUAL BASIC. Reqs. Bach. in Comp. Sci., Computer, Electrical or Electronics Engg. Systems Analyses. Comp. Info. Systems, Math or equiv. in ed. & exp. 2 yrs exp in job offered or 2 yrs related exp such as Systems Programmer, Programmer Analyst, System Analyst, Software Engineer or Consultant. Will accept 3 yrs college ed. plus 5 yrs exp in job offered or related occup in lieu of req'd ed. & exp. Must have some related exp designing, developing & maintaining applications & database administration. Must have exp. using SQL/DS, COBOL, CICS, REXX & FOCUS. $44,000/yr. 40 hrs/wk. 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #191595 "Employer Paid Ad"

Programmer Analyst (2 openings) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to client needs; analyze, design & develop computer software for clients EDP systems; analyze, design, develop, test & implement inventory management System apart from problem fixing & enhancements to legacy system (merchandise distribution, general ledger management, & flash sales analysis systems) on IBM 3090 platform using VS COBOL II, VSAM, FILEAID, DB2, QMF, SPUFI, CICS, REXX, DMF panels & INTERTEST. Reqs. Bach. in Comp. Sci., Computer, Electrical or Electronic Engg., Computer Information Systems or foreign equiv. 1 yr exp in job offered or 1 yr related exp such as an Assist. System Analyst, System Analyst, Software Engr., Consultant or Systems Engr. Must have some related exp analyzing, designing, developing, & testing on IBM 3090 using VS COBOL II, VSAM, FILEAID, DB2, QMF, SPUFI, CICS, REXX & INTERTEST. $46,000/yr., 40 hrs/wk 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #191495 "Employer Paid Ad"

Programmer Analyst (2 openings) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to client needs; analyze, design & develop computer software for clients EDP systems, analyze, design develop, test, conduct user meetings, implement & maintain taxation & revenue processing systems, developed on IBM 9370/30 mainframe using VS COBOL II, REXX & DB2 as database management system; on-line component developed using CICS, TSO/ISPF programming environment & JCL operating under MVS/ESA, analyze & design using IEF CASE tool. Reqs Bach. in Comp. Sci., Computer, Electrical or Electronic Engg., Systems Analysis, Comp. Info. Systems, Math or equiv. in ed. & exp., 2 yrs. exp in job offered or 2 yrs related exp such as Systems Analyst, Systems Engr., Sr. Systems Engr., Consultant or Software Engr. Will accept 5 yrs. college ed. plus 3 yrs exp in job offered or related occup in lieu of req'd ed. & exp. Related exp must include system analysis, design & software development. Must have exp using CICS, DB2, MVS/ESA, REXX, JCL, V8 COBOL II & ES9000. $48,880/yr., 40 hrs/wk 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #186295 "Employer Paid Ad"

Programmer Analyst (2 openings) to consult with clients to ascertain & define their business requirements or problem areas & utilize technical expertise to provide solutions to client needs; analyze, design & develop computer software for clients EDP systems; analyze, design, develop, test & implement inventory management System apart from problem fixing & enhancements to legacy system (merchandise distribution, general ledger management, & flash sales analysis systems) on IBM 3090 platform using VS COBOL II, VSAM, FILEAID, DB2, QMF, SPUFI, CICS, REXX, DMF panels & INTERTEST. Reqs. Bach. in Comp. Sci., Computer, Electrical or Electronic Engg., Computer Information Systems or foreign equiv. 1 yr exp in job offered or 1 yr related exp such as an Assist. System Analyst, System Analyst, Software Engr., Consultant or Systems Engr. Must have some related exp analyzing, designing, developing, & testing on IBM 3090 using VS COBOL II, VSAM, FILEAID, DB2, QMF, SPUFI, CICS, REXX & INTERTEST. $46,000/yr., 40 hrs/wk 8a-5p. Send resume to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref. #191495 "Employer Paid Ad"

Multiple openings exist for a Systems Analyst for a software consulting firm. Duties include: Design, develop, and analyze support services for the Litigation Management Desktop - "A Claims ReEngineering system." Includes process and data flow design and development of object oriented database client interaction for requirements study, module and system testing and documentation. Also, utilizing IBM AS 9000, IBM PC/XT/AT LAN/WAN, ORACLE 5.0, and ODBC & WindowsAPI. Includes the following software and hardware: VS3.0, MS Access, SQLServer, C/C++, Crystal Reports, DB2, QMF, MDI Gateways. Requires a Bachelors Degree in Computer Science. Requires two years experience in the job offered or two years experience as a Software Analyst to include experience in design and development of object-oriented databases using ORACLE 5.0. Salary is $40,000.00 per year. Hours: two 8:00 am to 5:00 pm, forty per week. Send resume to 7310 Woodward, Room 415, Detroit, MI 48202. Ref. #188695. Employer paid ad.

Systems Analyst - Analyze user reqs, design, develop, implement mgmnt info. systems on IBM/MVS hardware using DB2, CICS, COBOL and REXX. Define/establish DB2 Database structure. Prepare program specs and system docs. Debug and enhance existing systems. 40 hrs/wk, 8AM-5PM. $46,000/yr. Req. Bach deg. in Comp. Sci., Math or any Engineering & 2 yrs exp. Must have proof of legal authority to work in the United States. Send your resume to D.E.S. Workforce Center, P.O. Box 729 (800 7th, SI, SE), Cedar Rapids, Iowa 52406-0729. Refer to Job Order IA 11000447. Employer paid advertisement.

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- **Year 2000 Solutions**
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Our continuous growth provides immediate need for a Vice President, Solutions. The successful candidate needs to be a leader with the ability to develop strategies and a Technical Management infrastructure to support the rapidly expanding solutions business. Vice President, Solutions should possess skills and experience in the following areas:

**Business Development:**
- Proven ability to assess the marketplace
- Proven success with expansion/penetration into new client vertical markets
- Proven success with strategies that lead to "add-on" engagements
- Proven ability to:
  - evaluate client needs
  - identify business operations and solutions opportunities
  - research the scope and risk of potential engagements
  - manage the entire proposal process
  - produce and perform high-level presentations

**Consulting:**
- Must currently manage the overall practice of a minimum $50 million business portfolio
- Must have minimum 10 to 15 years experience in external consulting/ consultative selling
- Career path should illustrate an upward progression reflecting value-added contributions and high potential

**Project Management:**
- Demonstrated success in managing organizations with proven project life-cycle management methodologies (in the completion of both large and small systems/application development projects)
- Leadership in organizations with a proven record of successfully managing client needs, meeting project commitments and producing results

**Organizational Skills:**
- Proven ability to interact with varied organizations in order to assemble all resources required to staff engagements
- Ability to accomplish these goals under pressure from competition and/or urgent client demands

**Technical/Industry Expertise:**
- Technical expertise and understanding a plus
- Although candidate need not understand technology on a "hands-on" level, technical expertise must allow candidate to effectively set strategies, solve problems, and attack appropriate markets

**Educational Background: (Not requirements)**
- Undergraduate degree required
- MBA or other advanced degree a definite asset

***References are required and will be contacted.***

For consideration, FAX or send a resume to: **Resource Manager, COMPUTER HORIZONS CORP., 5455 Corporate Drive, Suite 300, Troy, MI 48098, FAX 810-641-1523, Phone 810-641-1500 or 800-252-3421. We are an Equal Opportunity Employer**

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- Strong working knowledge of PC based programming languages.
- Strong understanding and working knowledge of Visual Basic, PowerBuilder, Visual C++ graphical user interface (GUI) concepts and theory.
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- Experience with interface design and implementation theory (SDLC).

*Preferred qualifications.*

- Basic negotiation, leadership, and presentation skills.
- Good working knowledge of relational database products (Oracle, Informix).
- Good understanding and working knowledge of computer operating systems in windows environment (DOS).

For consideration, forward resume to:

**Catherine Willey**
**MBNA Personnel Office 1**
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**Wilmington, DE 19850-0950**
**Phone: 800-637-2070**

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**Manager Financial Systems** - Maitland, FL-Analyze design, construct enhancements for financial management systems using object-oriented programming to produce entity diagrams and process descriptions. Produce data dictionary, data elements and access keys. Perform database administration. Use Gupta products: SQL Windows, SQL Base, Quest, ReportWindows, SQL Network. Requires 2yrs experience M-F, 9AM-5PM, 40hrs/wk, $56,000/year. Submit resume to: Job Service of Florida, 1001 Executive Center Drive, Orlando, FL 32803-3520. Job order #FL-1267328.

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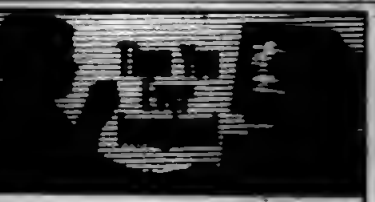

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95. Other_____ (Please Specify)

**2. TITLE/FUNCTION** (Circle one)
**IS/MIS/DP MANAGEMENT**
15. Chief Information Officer/Vice President/ Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Network Sys. Data/Tele. Comm., LAN Mgr. /PC Mgr., Tech Planning, Admin Sys.
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Programming Management, Software Developers
41. Engineering, Scientific, R&D, Tech. Mgr
60. Sys. Integrators/VARs/Consulting Mgt.

**CORPORATE MANAGEMENT**
11. President, Owner/Partner, General Mgr
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer

**DEPARTMENTAL MANAGEMENT**
51. Sales & Mktg. Management
70. Medical, Legal, Accounting Mgt.

**OTHER PROFESSIONAL MANAGEMENT**
80. Information Centers/Libraries, Educators, Journalists, Students
90. Other Titled Personnel

**3.** Do you use, evaluate, specify, recommend, purchase: (Circle all that apply)

Operating Systems
(a) Solaris (e) Mac OS
(b) Netware (f) Windows NT
(c) OS/2 (g) Windows
(d) Unix (h) NeXTstep

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Networking Products ❑ Yes ❑ No

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A Request for Proposals (RFP) for the operation and management of the Arkansas Department of Human Services (DHS) Office of Information Systems will be issued on January 2, 1996 to qualified offerors. The anticipated procurement will commence July 1, 1996 for one (1) year with two (2) two-year renewals.

The purposes of this procurement are to provide the Department with the technical skills and experience to maintain existing legacy applications and, over the course of the contract, to re-engineer applications to take advantage of new technologies that will put information on the desktops of program personnel.

Firms bidding on the RFP will be required to submit statements and documentation detailing offeror qualifications in the area of Human Services information systems operation and management. The deadline for submission of the mandatory letter of intent to bid is January 26, 1996. A pre-proposal conference will be held on January 19, 1996 at 9:00 a.m. Central Standard Time in the DHS Conference Room, Donaghey Plaza West, 4th floor, 616 Main Street in Little Rock. Proposal due date is March 4, 1996.

Questions regarding this procurement should be directed to:
Lynn Pumphrey, Issuing Officer
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Requires Bachelor's degree in Computer Science, Business, or equivalent experience 5 years' experience in training, consulting, analysis or applications development is required, as is planning, organizing, directing and controlling application development projects. Managing business requirement analysis with clients and coordinating the development of efficient/effective applications solutions is essential.

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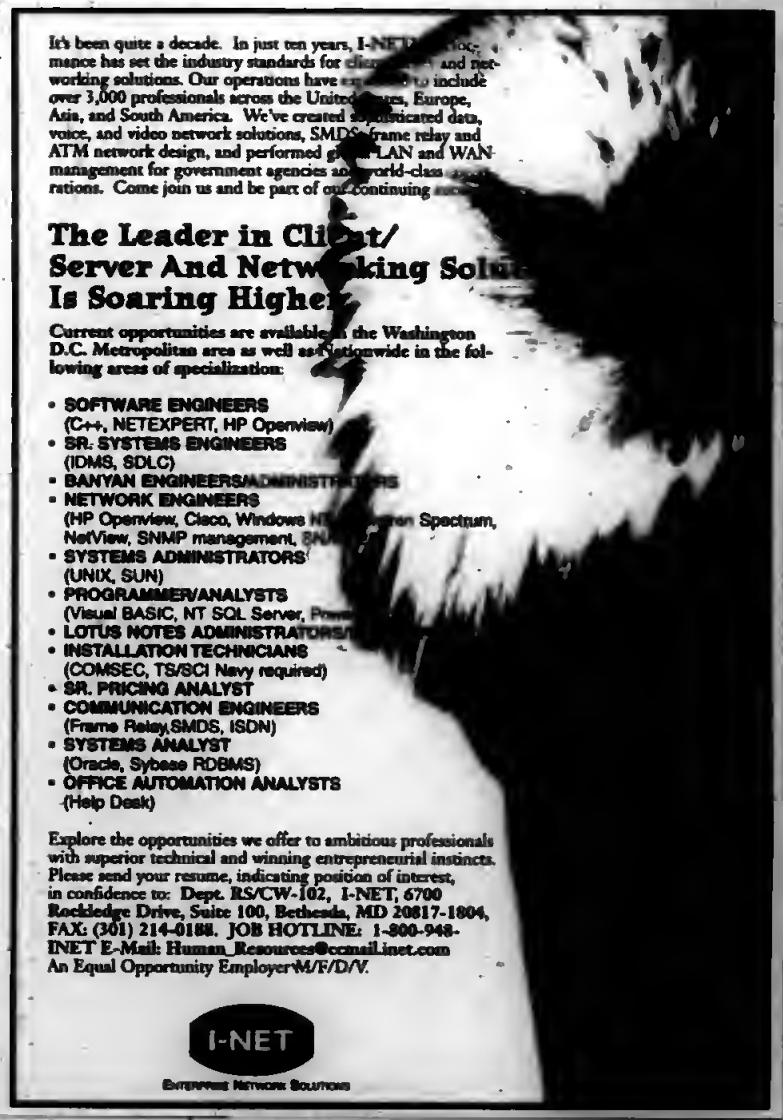

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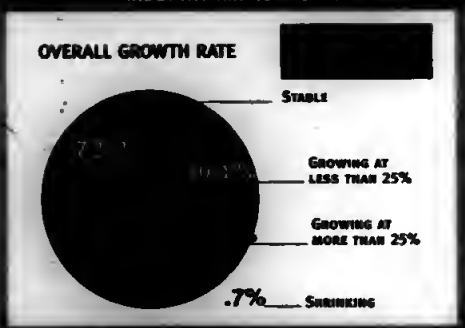


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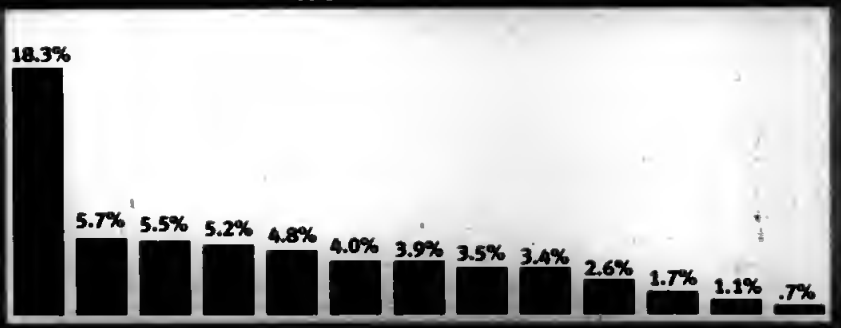

# Help with the housekeeping

## Application-deletion software makes disks run smoothly

By Lynn Haber

At a time when applications consume increasing amounts of hard drive space, disk housekeeping can improve system performance. Application-deletion software was designed to do just that: clean out unused applications and files.

On the market for only a few years, application-deletion products were designed to help Windows users automate what they had previously done manually. Many organizations still manually rebuild hard drives, a process that can take the better part of a day. "Unattended hard drives can, after a period of time, affect productivity and cost the organization for the technician's time as well as have the potential to introduce viruses," says Jim Garden, director of syndicated services at WorkGroup Technologies, Inc. in Hampton, N.H.

"An application-deletion program is a wise tool to consider — it frees up disk space and is a better investment than buying a bigger hard drive," Garden adds.

Greg Falzon, a software industry analyst at Computer Intelligence Infocorp in La Jolla, Calif., reports that the three leading product vendors — MicroHelp, Inc., Quarterdeck Corp. and Vertisoft Systems, Inc. — showed dramatic sales increases in early fall. "We expect to see volumes increase further because these products offer users a much-needed capability," he says. With the migration from Windows 3.1 to Windows 95, freeing up hard-disk space is important, he adds.

Deletion packages also remove bits and pieces of files located in various directories and Dynamic Link Libraries. Because files are spread across directories or shared by applications, it's often difficult for even sophisticated computer users to thoroughly remove applications, according to vendors.

If the job isn't done completely, unwanted files can be left on the hard disk, which means less hard-disk space for new applications or, worse, shared files are deleted, which can leave other applications inoperable.

With more than 50 million Windows 3.1 machines running 16-bit applications, compared with a few million Windows 95 devices running 32-bit applications, the market for Windows 3.1 deletion products is wide open.

Analysts caution, however, that application-deletion software vendors will have to enhance their products as more users move to Windows 95. That is because applications for Windows 95 must include an application-deletion feature.

Deletion software vendors say the uninstall feature in Windows 95-compliant applications is a step in the right direction and works best in pure 32-bit environments. However, they say, it is much less robust than what is available in third-party products.

Application-deletion software vendors have continually added features to their products. Vertisoft Systems' Remove-It includes a tool called Upgrade Assistant to help users upgrade to Windows 95. It was designed to make a dual boot scenario a viable option, letting users return to their Windows 3.x applications if they have problems with Windows 95, says Elliott Lowe, vice president of marketing.

TECHNOLOGY ROUNDUP

**Deletion software**

Another example of added features is MicroHelp's new application management capability. It is intended to help users move applications from one drive to another or to another directory. It lets users archive infrequently used applications by compressing them on the hard drive and restoring them at the click of an icon. MicroHelp also helps identify files that are candidates for deletion.

Michael Gartenberg, research director at Gartner Group, Inc. in Stamford, Conn., says users turn to these products to clean up the slack that other products leave. However, he suggests users test these products to make sure they do what they want them to do.

Analysts say there are several potential problems users can run into if application-deletion software is used incorrectly. For example, an "any clean" function, in which users can select all files with a common prefix, can result in deleting the wrong files.

Vendors have just begun to release Windows 95 versions of their software. Older releases will remove Windows 3.1 applications under Windows 95, but vendors advise waiting for the Windows 95 versions for complete functionality. ■

Haber is a freelance writer in Norwell, Mass.

### Application-deletion software vendors

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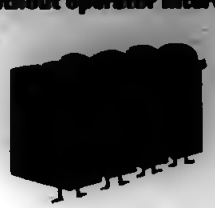

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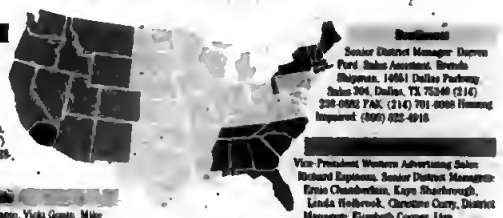

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# IBM

CONTINUED FROM PAGE 1

back from EMC Corp. and other big iron disk vendors. But with Seastar now two years away from hitting the beach, users and analysts said IBM has to rely on lowball pricing to keep Ramac enticing.

Its rivals will have no choice but to follow suit. Market watchers Meta Group, Inc. and International Data Corp. (IDC) now predict prices will fall by 40% or more in 1996 — well above the typical 30% annual decline (see chart).

**IBM holding on**

IBM still leads in mainframe disk revenue because it does a lot of business overseas where selling prices are higher. But it is running neck-and-neck with EMC on terabyte shipments. Late 1997 "seems like a long time to wait for a truly competitive product from IBM," said Tom Lahive, an analyst at IDC.

Several Ramac users agreed that customers should reap a dividend from IBM's delay. "The only thing IBM has to deal with is price," said Joel Van Dyke, manager of hardware planning at Chrysler Corp. in Centerline, Mich.

Chrysler stores 10T bytes of data on Ramac arrays and is intrigued by the fault-tolerant promise of Seastar. But there is now "probably a good chance" that the automaker will turn away from Ramac when it adds more mainframe disk capacity in mid-1996, Van Dyke said.

"I'm sure IBM is going to continue trying to buy its way into keeping [Ramac] on the floor," Van Dyke said. "But if alternative vendors stay with IBM on price and have better products, why shouldn't I buy from them?"

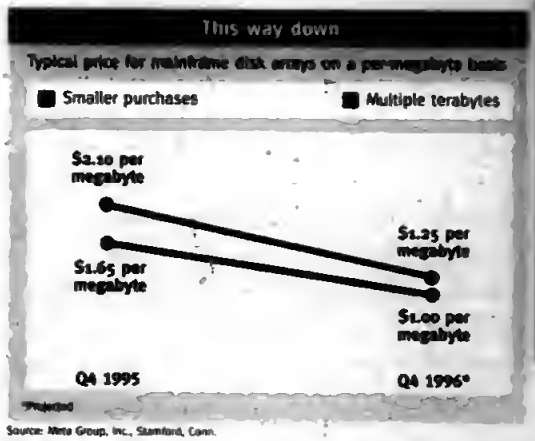
Barnett Banks, Inc. in Jacksonville, Fla., is another big Ramac customer. But whether it remains in the Ramac camp "is going to become an issue of price," said Michael Puldy, manager of resource management at the bank.

Ramac 2 still relies on IBM's aging 3990 Model 6 stand-alone controller, while EMC and other vendors integrate controllers with their arrays. A single 3990 also supports only 180G bytes of data, far below what rival products can handle. IBM will double that when the third Ramac ships, but it still will face footprint and cabling disadvantages, Puldy said.

Barnett Banks is considering building a 500G-byte data warehouse with one of its mainframes during 1996. "It would be nice if I could just pop in one [storage] box as opposed to needing three or four with cables scattered all over the place," Puldy said.

An IBM spokesman insisted the company's "plan of record has always been to ship [Ramac 3] in the first quarter of 1997." The development schedule was just finalized in December, but James Vanderslice, general manager of IBM's Storage Systems Division, said in late October that it was shooting for a 1996 release.

Users and analysts said they were told by IBM insiders to look for Ramac 3 in the third quarter of 1996. The later shipment makes it harder for IBM to stop the free fall of its mainframe disk market share, said Carl Greiner, an analyst at Meta Group in Stamford, Conn. EMC should slightly outship IBM in 1995 and then widen the gap in 1996, Greiner added. "It's not a pretty picture for IBM."




Source: Meta Group, Inc., Stamford, Conn.

Users wrestle with client/server chargeback issues. See page 73.

# WordPerfect: A done deal?

CONTINUED FROM PAGE 1

Watertown, Mass. "Novell wants to convert the WordPerfect assets to cash immediately. But Novell can't just do a handshake deal on the 31st. They have to have details of the deal all worked out and signed to conclude it by that date."

Outside of Novell, there is little surprise that it has taken more than two months to find a buyer.

"Novell thought they could say WordPerfect was up for sale and a flood of people would come to their door with suitcases full of money. But that didn't happen," said Amy Wohl, editor of "TrendsLetter," an industry newsletter in Narbarth, Pa.

**Short of cash**

In the running for a short period was a group of investors headed by Will Fastie, an independent computer consultant in Baltimore. But that group dropped out of the bidding in mid-December after six weeks of trying to raise the cash. "I just couldn't raise the money," Fastie said. He added that former WordPerfect President Pete Peterson was halfheartedly behind the group but seemed to lose interest along the way.

> "Novell thought they could say WordPerfect was up for sale and a flood of people would come to their door with suitcases full of money. But that didn't happen."
>
> *— Amy Wohl, editor of "TrendsLetter"*

A handful of big-name software firms approached Novell very early on, but ultimately they decided they weren't interested. IBM and Computer Associates International, Inc. were said to be among those parties, according to sources close to the negotiations.

But Novell put too many restrictions on the sale, turning off potential software suitors, sources said. For example, it wants the new owner to assure that no jobs will be cut, that employees won't be relocated and that product development will continue.

With these stringent conditions, Fastie said Novell is likely to get only $100 million to $200 million for the WordPerfect applications business, not the reported $400 million it thought WordPerfect would fetch.

Novell purchased WordPerfect in June 1994 in a stock swap valued at $855 million.

# IBM/Ameritech integration pact set

By Neal Weinberg

IBM and Ameritech Corp. are joining the ranks of network integrators — those companies that offer one-stop shopping for users who want to outsource their desktop-based computing and communications systems.

Under a recently announced alliance, Ameritech and an IBM subsidiary will manage PC hardware and software, telephones, private branch exchange equipment; LANs and videoconferencing systems.

Ameritech is the Chicago-based regional Bell operating company; Integrated Systems Solutions Corp. (ISSC), the IBM subsidiary, specializes in systems integration.

**All in one**

Network integration is a fast-growing field that takes traditional systems integration and adds the telecommunications component.

The benefit to users is the opportunity to obtain an all-encompassing, long-term agreement that addresses a wide range of thorny issues such as global connectivity, or the integration of voice, video and data, said Traver Kennedy, an analyst at Aberdeen Group, Inc. in Boston.

Ray Sheedy, director of corporate telecommunications at Walgreen Co. in Deerfield, Ill., said he would be willing to consider outsourcing his desktop operations. He said he is especially interested in a package that would address the needs of remote users.

But Sheedy said he would be reluctant to outsource applications that contain sensitive information, such as pharmacy records.

Kennedy said that one of the challenges facing Ameritech and IBM is how to price the service so it is attractive, while still making a profit. Another challenge will be to address the culture clash between the world of computers, where product cycles are measured in months, and telecommunications, where product cycles are measured in years.

As part of the agreement, Ameritech and IBM have signed a seven-year, $400 million deal in which ISSC will manage Ameritech's desktop computing and Ameritech will provide a good chunk of IBM's voice and video desktop support nationwide.

# Apple and Microsoft licensing deal stalled

By Stuart J. Johnston and Lisa Picarille

With the new year upon us, it looks like it will be out with the old but not necessarily in with the new at Apple Computer, Inc.

Apple's contract to sell Microsoft Corp.'s Windows 3.x and MS-DOS for use on Apple's DOS/Windows-compatible systems expires at midnight Dec. 31, 1995.

However, Apple has been unable to come to a license agreement with Microsoft to sell Windows 95 in place of those systems, Apple and Microsoft officials confirmed.

The sticking point for Apple is a requirement in Microsoft's license that Apple indemnify Microsoft, other OEMs and users from any patent infringement claims.

"We are not willing to meet Microsoft's demands on that issue," said Pam Miracle, a spokeswoman for Cupertino, Calif.-based Apple.

Not renewing its license with Redmond, Wash.-based Microsoft will affect Apple's ability to bundle copies of Windows with Apple's products but will have little impact on users.

"Our systems will still be Windows-compatible, but users will have to purchase their own shrink-wrapped copy of Windows," Miracle said.

# Microsoft more dangerous now as 'follower'

*Charles Babcock*

When it came to positioning itself on the Internet, Microsoft played a hand in which it held weak cards. Now, having gotten through that hand, it could find itself back in the game, bidding for higher stakes.

I would urge any Internet companies that are busy toasting their triumph — and their high stock prices — to put the champagne back in the refrigerator and hurry back to work.

Microsoft's maneuver illustrates a new poise achieved under the pressure of rapid-fire events. The company has been much quicker than Digital or IBM (or just fill in the name of any former minicomputer or mainframe company) to adjust to a sea change in the marketplace. Its about-face shows that Microsoft can evaluate a challenge on its technical, business and legal merits rather than on just one of those factors.

Microsoft Chairman Bill Gates explained the company's move in a *Computerworld* interview by noting that Cobol, Visual Basic and C represent the lion's share of activity in standard programming languages. "Now Java is the best candidate to come along for quite some time to be added to that list," he said.

**In the commander's genuflection, he bent his knee, but he didn't throw away his weapons or dismiss his army.**

What did he mean? That Java is technically a distinct and mature language, ready to join the ranks of the standards such as Cobol, C and Basic? If anyone knows better, Gates does.

Java is a C++ knockoff, originally designed for embedded systems in set-top boxes, and we all know how successful they were. Java was drastically underemployed and in need of work when the explosion in World Wide Web servers occurred. Sun Microsystems, as a primo supplier of Web servers, finally found something for its youngster to do (thanks to the sheer woodenness of HyperText Markup Language).

So why does Gates like Java so much? I don't know that he does. I wouldn't accuse him of whiling away long winter evenings writing Java programs. Rather, his real judgment was a business/political assessment.

Java has quickly commanded a following of Microsoft competitors, third-party vendors and the Web development community, which Microsoft also would like to address. Gates had the opportunity to alienate them at a stroke by telling the truth: that Java is young and rough. He could have just said that Microsoft can produce something as good in a twinkling.

Instead, he chose not to fight the judgment of the developer community and accepted the fact that Microsoft is a latecomer to the Internet party.

That scarcely means the party is over. On the contrary, this is just the kind of party Microsoft enjoys: a huge, emerging, mass market hungry for enabling products and powered by the most technically literate, self-sufficient elements of society. Throw the crowd a bone when it needs one, and it will make you a king.

Consider also how the acceptance of Java as a standard buttresses Microsoft's position vs. the Justice Department, which is watching for signs of monopolistic actions. For whatever reasons, Microsoft hasn't moved vigorously on The Microsoft Network, its Explorer browser or its Blackbird programming language.

Microsoft has bought itself some room to maneuver on the legal front by accepting a competitor's standard. In the past, we have watched Microsoft use its strength to undermine and drive away competitors who once represented de facto standards. If it used its near-monopoly power in desktop operating systems and applications to gain a monopoly in core Internet technology, some deep thinker in government would say, "Enough. This overbearing tendency is restraining competition."

In an interesting companion move, Microsoft licensed Oracle's PowerBrowser OCX for using OLE controls on the Internet, and Oracle licensed Microsoft's Visual Basic Script. Oracle was an early backer of Java and remains one. And it has never been accused of being too cozy with Microsoft. So diplomacy is being viewed by both as a more effective business relationship than acrimony.

So, I join those who cheer Microsoft's new follower status. But I would point out that in the commander's genuflection, he bent his knee but didn't throw away his weapons or dismiss his army. A gentler, more humble Microsoft may prove an extremely dangerous adversary.

Babcock is *Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.

## Inside Lines

### PC prices keep on tumblin'

Watch for the next big round of PC price cuts in early February. Intel is expected to roll back prices on its entire Pentium lineup and possibly even its newly released Pentium Pro chips, said a source close to the company. The price cuts are expected to make way for Intel's latest 166-MHz Pentium chip, which is scheduled to be released in the first quarter. The cuts will range from at least 16% to 30%. The biggest cuts will be on 75-MHz and 90-MHz Pentiums, the source said.

### Prelude to an IPO?

Systems management vendors Tivoli and McAfee are about to take minority stakes in Net.genesis, a hot-and-getting-hotter Web tools maker in Cambridge, Mass., according to a source at Net.genesis. The threesome is expected in 1996 to build graphical utilities for the care, feeding and troubleshooting of internal internet, or intranet, applications — an ugly task in sore need of technology. Tivoli and McAfee each got a seat on the board of privately held Net.genesis. Finance firms Robertson, Stephens & Co. and Hambrecht & Quist also are close to signing pacts to inject cash into the small company, the source said.

### Godzilla deals

IBM recently filed with the Securities and Exchange Commission to sell off $1.7 billion worth of debt securities. That would bring IBM's available-cash balance to $10.7 billion. Wall Street watchers say Big Blue is likely to use this money to make a large acquisition that would better position it against 800-pound gorilla Microsoft. Could IBM by eyeing Apple or Novell, perhaps? Don't forget the hint uttered by Jerome York, IBM's former CFO: "Lotus is not the King Kong deal."

### More NT storage management

Watch for broader Windows NT support for storage management the week of Jan. 22 from Palindrome, the Naperville, Ill., network backup company owned by Seagate Technology. Upcoming NT Edition software includes Vista, the Visual Storage Administrator, and a new version of Palindrome Storage Manager.

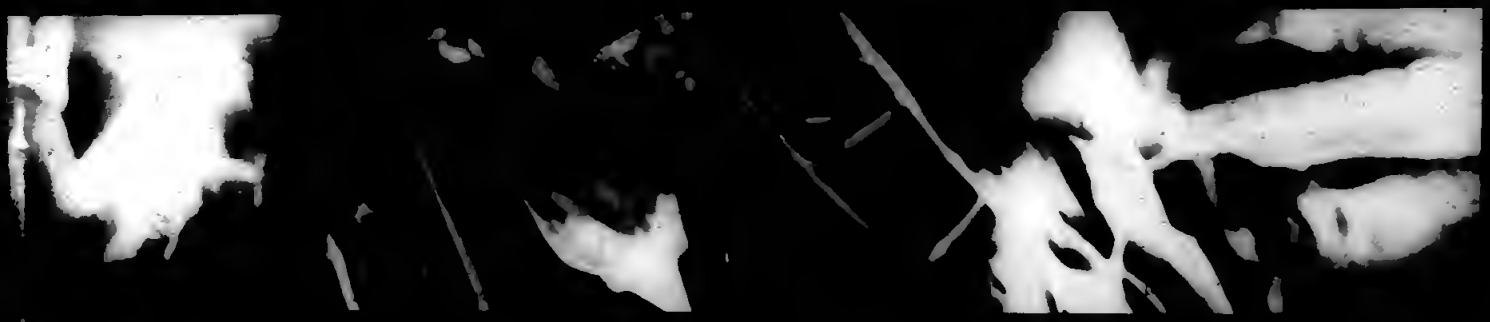
### Knocking on Notes' doors

IBM in late January will announce plans for closely tying Notes 4.0 to its MQSeries messaging middleware, so desktop Notes users can have direct access to data on mainframes and other back-end systems. Support for the LotusScript scripting language used by Notes 4.0 is being built into MQSeries, IBM sources said. LotusScript on MQSeries will be demonstrated at Lotusphere '96 the week of Jan. 22 and should ship by mid-1996. Also on the Notes front, Casahl Technology will soon announce client/server software that will let Notes users access, migrate and synchronize data between Notes and multiple external databases — either relational or legacy systems.

The 5th Wave by Rich Tennant

MACINTOSH 101
Before I go on to explain more advanced procedures like the 'Zap-Powdy-Students-Who-Don't-Pay-Attention' function, we'll begin with some basics."

*Jingle bells, Batman smells. Wait, that's not it. What are those dang lyrics? Web revelers who don't know their rootie toot toots from their rummy tum tums should check out ftp://col.hp.com/html/tbc/Xmas/index.html. Tim Chambers, a software engineer at Hewlett-Packard, kindly assembled the words to some of the most popular holiday ditties around. Is it nine lords a-leaping or nine ladies dancing? (It's the latter.) Or you can brush up on "Auld Lang Syne," a song with just 42 words. (One-third of them are "auld," "lang" or "syne.") Once your tunes are all in a row, round up your news tips and get in touch with* Computerworld *via our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or via the Internet at maryfran_johnson@cw.com.*



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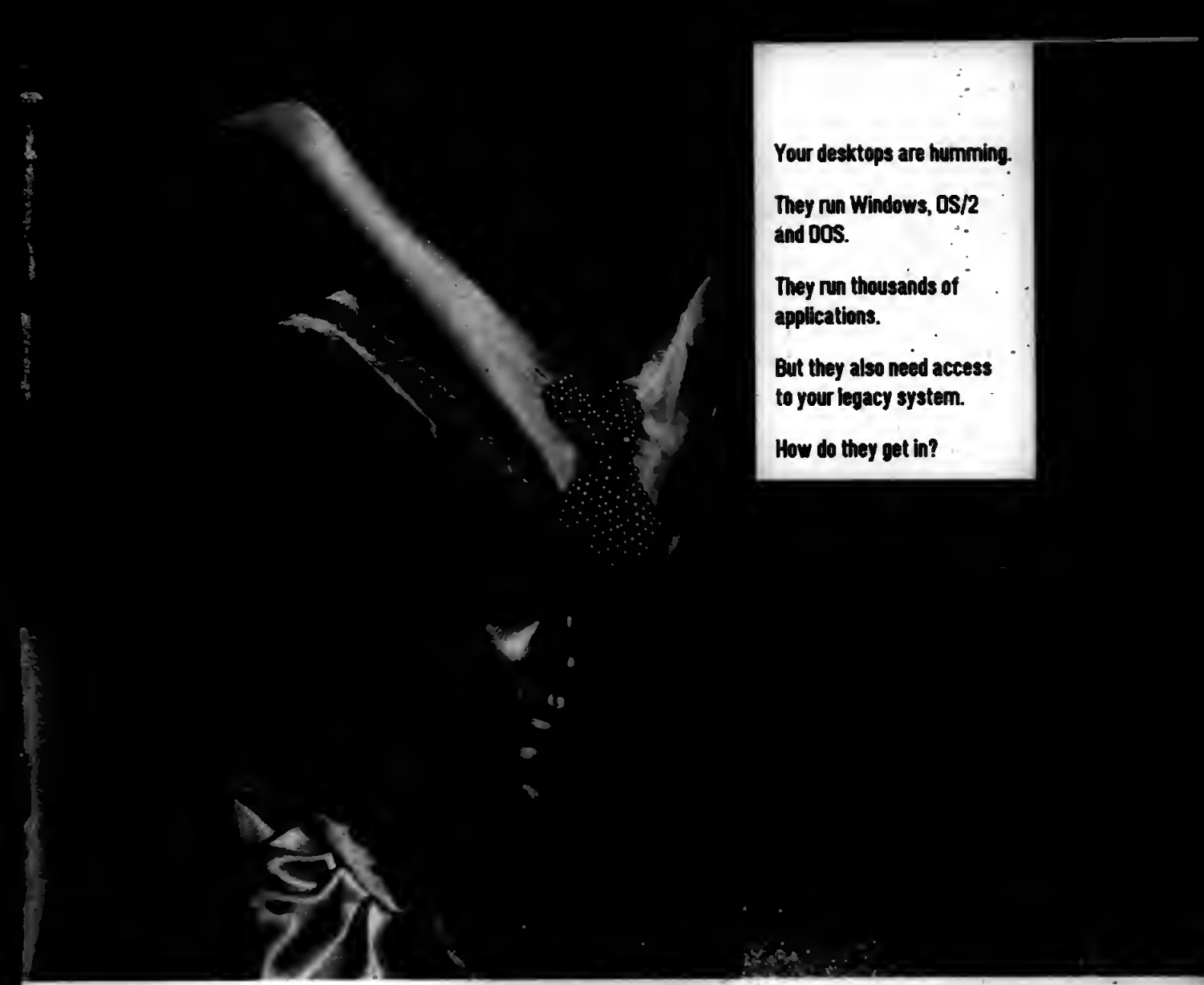

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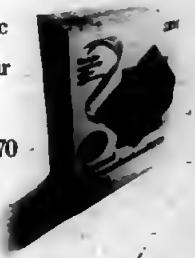

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